Data Source:

Section is specifically for 6" CI

Your Choice (weight: 5) --Yes

- Have damages occurred on cast iron due to ground movement, frost heave, earth subsidence? (OFNF302)

  Data Source:

  R104/109 WAM Cleared Leak Report

  Your Choice (weight: 4) --Yes

- Have natural forces caused leaks, failures or damages to steel or plastic pipeline in the system/section? (OFNF303)

  Data Source:

  Section is specifically for 6" CI Main

  Your Choice (weight: 0) --No

- Review the guidance. (OFNFCSQ0)

  Your Choice (weight: 0) --Continue

- Are the pressure and/or diameter of this section greater than or about the same as the system as a whole? (OFNFCSQ1)

  Data Source:

  Section is specifically for 6" CI, which is slightly larger diameter than system mains and services as a whole.

  Your Choice (weight: 0.1) --Somewhat greater

- Is this section predominantly located in business districts or outside business districts (as those are defined for leak survey)? (OFNFCSQ2)

  Data Source:

  Approximately 93% of 6" CI Mains are designated as Residential per R43A WAM reports.

  Your Choice (weight: 0) --Outside Business Districts

- How long would it typically take utility crews to reach this part of the system after receiving notice of a possible failure? (OFNFCSQ3)

  Data Source:

  CFirst Leak Response Time Reporting.

  Your Choice (weight: 0) --Less than one (1) hour

- What would be the impact on the utility and its customers if this section were to fail? (OFNFCSQ4)

  Data Source:

  Natural Force Leaks on 6" CI Mains account for approximately 55% of total number of natural force leaks.

  Your Choice (weight: 0.05) --Moderate

Other Outside Forces Threat

- **Other Outside Forces (OFOTHR) (PEOPLES GAS - Entire System)**
  - Interview Start (OFOTHR)

    Your Choice (weight: 0) --Continue

  - Do leaks repaired per year average one (1) or more? (OFOTHR101rp)

    Data Source:

    PHMSA Annual Reports

    Your Choice (weight: 0) --

Table 11.48. Leak Repairs From PHMSA 7100.1-1

	Other Outside Forces		Totals	
End of Year	Mains	Services	Mains	Services
In 2005	57	14	57	14
In 2006	6	8	6	8
In 2007	9	13	9	13
In 2008	4	14	4	14
In 2009	0	5	0	5
In 2010	3	19	3	19
In 2011	0	14	0	14
In 2012	6	85	6	85
In 2013	10	51	10	51
In 2014	8	32	8	32

  - How many other outside forces damages not resulting in leaks reported on the PHMSA 7100.1-1 form have occurred during the years shown? (OFOTHR101nr)

    Data Source:

    Data not available.

    Your Choice (weight: 0) --

Table 11.49. End of Year

	Mains	Services
In 2005	0	0
In 2006	0	0
In 2007	0	0
In 2008	0	0
In 2009	0	0
In 2010	0	0
In 2011	0	0
In 2012	0	0
In 2013	0	0
In 2014	0	0

  - Here is a summary of your other outside forces damages during the years shown.

    Click Next to Continue. (OFOTHR101)

    Your Choice (weight: 0) --

Table 11.50. End of Year

	Leak Repairs	Damages Not Reported	Total
In 2005	71	0	71
In 2006	14	0	14
In 2007	22	0	22
In 2008	18	0	18
In 2009	5	0	5
In 2010	22	0	22
In 2011	14	0	14
In 2012	91	0	91
In 2013	61	0	61
In 2014	40	0	40

- SHRIMP has determined that leaks, failures or damages are averaging one (1) or more per year.**(see guidance)**.

  Do you accept this determination? (OFOTHR101aok)

  Your Choice (weight: 0) --Accept

- Your data and choices indicate that leaks, failures or damages are averaging one (1) or more per year. (OFOTHR101a)

  Your Choice (weight: 0) --Continue

- Are above ground facilities being hit by vehicles? (OFOTHR301)

  Data Source:

  LKMS database and WAM R104/109 Leak Cleared Reports

  Your Choice (weight: 5) --Yes

- Have below ground facilities been damaged due to heavy vehicles driving along or over the facility location? (OFOTHR302)

  Data Source:

  LKMS database and WAM R104/109 Leak Cleared Reports

  Your Choice (weight: 4) --Yes

- Has damage been caused by malicious actions (vandalism) of unauthorized individuals or unauthorized alteration of system? (OFOTHR303)

  Data Source:

  LKMS database and WAM R104/109 Leak Cleared Reports

  Your Choice (weight: 3) --Yes

- Are the other outside force leaks, failures or damages system-wide or concentrated in local areas? (OFOTHR103)

  Your Choice (weight: 0) --Concentrated

- Do you want to sub-section areas by concentrated damage repairs from the remainder of the section? (OFOTHR104)

  Your Choice (weight: 0) --Yes

- Enter sections of concentrated damage repairs. (OFOTHR105)

Your Choice (weight: 0) --

Table 11.51. Section

	Mains	Services	Description
Other Outside Force Damage - Services	0.000	515719	Other Outside Force Damages on Service Pipes
Other Outside Force Damage - Mains	4327.245	0	Other Outside Force Damages on Main Pipes
	0.000	0	
	0.000	0	
	0.000	0	
	0.000	0	
	0.000	0	

- Provide Additional Information (OFOTHR105a)

  Your Choice (weight: 0) --

  - **Other Outside Forces (OFOTHR-1a) (Other Outside Force Damage - Services - Other Outside Force Damages on Service Pipes)**

    - Interview Start (OFOTHR-1a)

      Your Choice (weight: 0) --Continue

    - Do damages repaired per year average one (1) or more? (OFOTHR101)

      Data Source:

      LKMS and WAM Leak Reporting Databases

      Your Choice (weight: 0) --

      Table 11.52. End of Year

	Damages Repaired
In 2005	14
In 2006	8
In 2007	13
In 2008	14
In 2009	5
In 2010	19
In 2011	14
In 2012	85
In 2013	51
In 2014	32

    - SHRIMP has determined that leaks, failures or damages are averaging one (1) or more per year.**(see guidance)**.

      Do you accept this determination? (OFOTHR101aok)

      Your Choice (weight: 0) --Accept

    - Your data and choices indicate that leaks, failures or damages are averaging one (1) or more per year. (OFOTHR101a)

      Your Choice (weight: 0) --Continue

    - Are above ground facilities being hit by vehicles? (OFOTHR301)

      Data Source:

      LKMS and WAM Leak Reporting Databases

      Your Choice (weight: 5) --Yes

- Have below ground facilities been damaged due to heavy vehicles driving along or over the facility location? (OFOTHR302)

  Data Source:

  LKMS and WAM Leak Reporting Databases

  Your Choice (weight: 4) --Yes

- Has damage been caused by malicious actions (vandalism) of unauthorized individuals or unauthorized alteration of system? (OFOTHR303)

  Data Source:

  LKMS and WAM Leak Reporting Databases

  Your Choice (weight: 3) --Yes

- Review the guidance. (OFOTHRCSQ0)

  Your Choice (weight: 0) --Continue

- Are the pressure and/or diameter of this section greater than or about the same as the system as a whole? (OFOTHRCSQ1)

  Data Source:

  This section (service pipes) is generally representative of PGL's system as a whole.

  Your Choice (weight: 0) --About the same

- Is this section predominantly located in business districts or outside business districts (as those are defined for leak survey)? (OFOTHRCSQ2)

  Data Source:

  This section (service pipes) is predominantly designated as residential.

  Your Choice (weight: 0) --Outside Business Districts

- How long would it typically take utility crews to reach this part of the system after receiving notice of a possible failure? (OFOTHRCSQ3)

  Data Source:

  CFirst Leak Response Time Reporting.

  Your Choice (weight: 0) --Less than one (1) hour

- What would be the impact on the utility and its customers if this section were to fail? (OFOTHRCSQ4)

  Your Choice (weight: 0) --Low

- **Other Outside Forces (OFOTHR-1a) (Other Outside Force Damage - Mains - Other Outside Force Damages on Main Pipes)**

  - Interview Start (OFOTHR-1a)

    Your Choice (weight: 0) --Continue

- Do damages repaired per year average one (1) or more? (OFOTHR101)

  Your Choice (weight: 0) --

  Table 11.53. End of Year

	Damages Repaired
In 2005	57
In 2006	6
In 2007	9
In 2008	4
In 2009	0
In 2010	3
In 2011	0
In 2012	6
In 2013	10
In 2014	8

- SHRIMP has determined that leaks, failures or damages are averaging one (1) or more per year.**(see guidance)**.

  Do you accept this determination? (OFOTHR101aok)

  Your Choice (weight: 0) --Accept

- Your data and choices indicate that leaks, failures or damages are averaging one (1) or more per year. (OFOTHR101a)

  Your Choice (weight: 0) --Continue

- Are above ground facilities being hit by vehicles? (OFOTHR301)

  Data Source:

  LKMS and WAM Leak Reports

  Your Choice (weight: 5) --Yes

- Have below ground facilities been damaged due to heavy vehicles driving along or over the facility location? (OFOTHR302)

  Data Source:

  LKMS and WAM Leak Reports

  Your Choice (weight: 4) --Yes

- Has damage been caused by malicious actions (vandalism) of unauthorized individuals or unauthorized alteration of system? (OFOTHR303)

  Data Source:

  No record of malicious acts against main pipe in LKMS or WAM database observations.

  Your Choice (weight: 0) --No

- Review the guidance. (OFOTHRCSQ0)

  Your Choice (weight: 0) --Continue

- Are the pressure and/or diameter of this section greater than or about the same as the system as a whole? (OFOTHRCSQ1)

  Data Source:

  This section (main pipe) is generally larger diameter/higher pressure than the system as a whole.

  Your Choice (weight: 0.1) --Somewhat greater

- Is this section predominantly located in business districts or outside business districts (as those are defined for leak survey)? (OFOTHRCSQ2)

  Data Source:

  Approximately 80% of main pipe is classified as residential piping per R43 WAM Report.

  Your Choice (weight: 0) --Outside Business Districts

- How long would it typically take utility crews to reach this part of the system after receiving notice of a possible failure? (OFOTHRCSQ3)

  Data Source:

  Cfirst Leak Response Time Reporting.

  Your Choice (weight: 0) --Less than one (1) hour

- What would be the impact on the utility and its customers if this section were to fail? (OFOTHRCSQ4)

  Your Choice (weight: 0.05) --Moderate

Other Threats Threat

- **Other Threats (OTHR) (PEOPLES GAS - Entire System)**
  - Interview Start (OTHR)

    Your Choice (weight: 0) --Continue

  - Has this system experienced failures or other safety problems due to causes that were not addressed during the evaluation of the other threats? (OTHR101)

    Data Source:

    LKMS and WAM database cause codes = "Other"

    Your Choice (weight: 0) --Yes

  - Enter, on a separate line below, a name for each Other Threat that you are experiencing and a brief description of the problem. (OTHR102a)

    Your Choice (weight: 0) --

Table 11.54. Section

	Description
Bell Joints & Mechanical Joints	Leaking Main Bell & Mechanical Joints Due to Age
Other Outside Force Damage - Crossbores	Gas Pipe Bored Through Sewer Lateral
Incorrect Operations - Non-	Installation of Non-Approved Materials

Approved Material	Installation of Non-Approved Materials
Inaccessible Valves	Paved Over, Dirt in B-Box
Meters/Shutoffs Inaccessible	No Access to Meter or Shutoff
Incorrect Operations - Improper Odorization	Too Little or Much Mercaptin
Corrosion - Cased Pipelines	Cathodic Protected Steel Pipelines inside Metallic Casings
Excavation Damage - Critical Facilities	Excavation near HP Pipelines, >=16" MP Pipelines, Vaults, Remote Operated Valves, and Current Rectifiers
Other Outside Force - Occupant Use	Unauthorized Turn-on By Customer
Excavation Damage - Inactive Services	Service Pipes Designated as Inactive
Other - Soft Closed Accounts	Supply to Vacant Property Remaining Active

- Provide Additional Information (OTHR102c)

  Your Choice (weight: 0) --

  - **Other (OTHR-1a) (Bell Joints & Mechanical Joints - Leaking Main Bell & Mechanical Joints Due to Age)**
    - Interview Start (OTHR-1a)

      Your Choice (weight: 0) --Continue

    - Please describe the failures or problems. (OTHR110)

      Data Source:

      LKMS database WAM R104/109 Cleared Leak Report

      Your Choice (weight: 0) --Leaking Mechanical & Bell Joints on Cast Iron and Ductile Iron Mains. 2005-2009 LKMS database - Totals for "Other" on are 5015 main repairs. A majority (71%) of the mains are low pressure and the leaks were on a Bell & Spigot joint. Cast Iron that is 6” in diameter is the most common cast iron size in the system and consist of 61% of the leaks for “Other” main repairs. Main repairs were distributed among the shops: 46% North Shop, 28% Central Shop, and 26% South Shop. In the LKMS database, sort LKDSC column using text filters Joint, BJ, MJ. 2010-2014 R104/109 Report - 2,206 "Other" Main Repairs on Cast Iron, with the majority occurring in North District: 58% North Shop, 26% South Shop, 16% Central Shop. There has been a drastic reduction in the number of reported "Other" leaks due to an effort to better classify the cause of the leak when it is encountered. 6" LP CI is still the most common cast iron size and pressure in the system.

    - Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

      Data Source:

      LKMS/WAM database remarks section, management directive and procedures.

      Your Choice (weight: 0) --Mechanical & Bell joint repairs - injecting Permabond Internal Sealant, External seal with Miller Encapsulant. Training and Qualifying contractors to assist in joint repairs. Accelerated Main Replacement Project.

    - Review the guidance. (OTHRCSQ0)

      Your Choice (weight: 0) --Continue

  - **Other (OTHR-1a) (Other Outside Force Damage - Crossbores - Gas Pipe Bored Through Sewer Lateral)**
    - Interview Start (OTHR-1a)

      Your Choice (weight: 0) --Continue

- Please describe the failures or problems. (OTHR110)

  Your Choice (weight: 0) --Horizontal Directional Drilling or other trenchless technology (guided or unguided) can unknowingly bore through a sewer lateral. The threat comes from sewer clean out personnel damaging the gas line during clean out operations.

- Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

  Your Choice (weight: 0) --Section 920 of Operations and Maintenance Manual: Damage Prevention - Trenchless Technologies Distribution Department General Order 0.801: Procedure and Policies for Addressing Legacy Sewer Crossbores Multiple Administrative Directives outlining use of pre and post camera technologies to document path of directionally-drilled main

- Review the guidance. (OTHRCSQ0)

  Your Choice (weight: 0) --Continue

- **Other (OTHR-1a) (Excavation Damage - Critical Facilities - Excavation near HP Pipelines, >=16" MP Pipelines, Vaults, Remote Operated Valves, and Current Rectifiers)**

  - Interview Start (OTHR-1a)

    Your Choice (weight: 0) --Continue

  - Please describe the failures or problems. (OTHR110)

    Data Source:

    SME Vip Kapoor, Manager System Integrity

    Your Choice (weight: 0) --Excavation activities near critical facilities is a threat with a much higher consequence factor if the facility is damaged. The following Facilities are designated as "Critical Facilities": All Pipelines designated as High Pressure All 16" and greater Medium Pressure Pipelines Vaults Remotely Operated Valves Impressed Current Rectifiers

  - Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

    Data Source:

    SME Vip Kapoor, Manager System Integrity

    Your Choice (weight: 0) --All excavation activities near an identified critical facility are monitored on-site by company personnel, from initial excavation through final backfill. A daily email is generated by System Integrity Engineers detailing each critical excavation site, including the location, excavator, Dig #, Type of Work, and Facility Type and Size. Shut Down and Contingency Plans are developed for each proposed critical excavation in the event the facility is damaged. All boring near critical facilities is monitored.

  - Review the guidance. (OTHRCSQ0)

    Your Choice (weight: 0) --Continue

- **Other (OTHR-1a) (Incorrect Operations - Non-Approved Material - Installation of Non-Approved Materials)**

  - Interview Start (OTHR-1a)

    Your Choice (weight: 0) --Continue

  - Please describe the failures or problems. (OTHR110)

Data Source:

SME William Good - Supervisory Engineer Compliance Group

Your Choice (weight: 0) --This threat addresses the use or installation of unauthorized materials, including pipe, fittings, meters, regulators, etc.

- Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

  Data Source:

  SME William Good - Supervisory Engineer Compliance Group

  Your Choice (weight: 0) --As a result of the threat of unauthorized materials being installed, the Standards Group was developed in order to track and manage the types of materials that are approved for use.

- Review the guidance. (OTHRCSQ0)

  Your Choice (weight: 0) --Continue

- **Other (OTHR-1a) (Other Outside Force - Occupant Use - Unauthorized Turn-on By Customer)**
  - Interview Start (OTHR-1a)

    Your Choice (weight: 0) --Continue

  - Please describe the failures or problems. (OTHR110)

    Data Source:

    SME Engineer Brian Martinkus, Field Service Planning

    Your Choice (weight: 0) --This threat concerns the possibility of a leak when a customer illegally restores gas service to a property after being disconnected for non-payment or regulatory reasons.

  - Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

    Data Source:

    SME Engineer Brian Martinkus, Field Service Planning

    Your Choice (weight: 0) --All previously known Occupant Use Orders were completed. Any accounts that are currently inactive but showing usage are immediately ordered an additional disconnect request. If the meter is outside, or if there no active accounts at the premise, the disconnect order is completed within 5 days. Otherwise, the order is completed within 30 days, and all affected customers are notified of the pending disconnect. Consecutive Occupant Use Disconnect orders for the same address are issued a Distribution Cut-off (a physical disconnection from gas service.)

  - Review the guidance. (OTHRCSQ0)

    Your Choice (weight: 0) --Continue

- **Other (OTHR-1a) (Excavation Damage - Inactive Services - Service Pipes Designated as Inactive)**
  - Interview Start (OTHR-1a)

    Data Source:

    Interview held with SME Nicholas Wood, Engineer Distribution Planning

Your Choice (weight: 0) --Continue

- Please describe the failures or problems. (OTHR110)

  Data Source:

  SME Nicholas Wood - Engineer Distribution Planning PGL Hit Database

  Your Choice (weight: 0) --Services designated as "Inactive" but still gassed can pose a threat during nearby excavation activities. Mapping information for inactive services is sometimes incomplete, and as a result, can lead to incorrect locating. Services that have been inactive for more than 10 years are more susceptible to potential excavation damage.

- Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

  Data Source:

  SME Nicholas Wood - Engineer Distribution Integrity

  Your Choice (weight: 0) --In 2014, inactive services were separated in three main buckets based on the length of time they have been inactive: Over 10 years, over 3 years, and under 3 years. That year, approximately 100 of the oldest inactive services were physically cut from the main and permanently retired. Additionally, any inactive service pipe that contains Copper, Bare Steel, Cast/Ductile Iron, or Clear Plastic are physically cut and retired. Services made of other materials are auto-retired after 3 years of inactivity. Retirement goals for inactive services will increase for each of the next two years, with 200 planned for 2015 and 250 planned for 2016. Alignment with AMRP retirements has also been considered. TEG Standard 1050 - Facility Deactivation and Abandonment was also established.

- Review the guidance. (OTHRCSQ0)

  Your Choice (weight: 0) --Continue

- **Other (OTHR-1a) (Other - Soft Closed Accounts - Supply to Vacant Property Remaining Active)**
  - Interview Start (OTHR-1a)

    Your Choice (weight: 0) --Continue

  - Please describe the failures or problems. (OTHR110)

    Data Source:

    SME Glannie Chan - Supervisory Engineer Compliance Group

    Your Choice (weight: 0) --When an account is soft closed, gas is not normally shut off to the residence. This means gas is still being supplied to all of the appliances. However, since the property is likely vacant, if a leak were to occur, no emergency calls would be made to the gas company.

  - Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

    Data Source:

    SME Glannie Chan - Supervisory Engineer Compliance Group

    Your Choice (weight: 0) --Currently, there is no explicit procedure outlined to address the issue of soft closed accounts. However, if an ISI is pending for an account that is soft closed, a disconnect order is generated for the address.

  - Review the guidance. (OTHRCSQ0)

Your Choice (weight: 0) --Continue

- **Other (OTHR-1a) (Inaccessible Valves - Paved Over, Dirt in B-Box)**
  - Interview Start (OTHR-1a)

    Your Choice (weight: 0) --Continue

  - Please describe the failures or problems. (OTHR110)

    Your Choice (weight: 0) --Distribution Valves may be inaccessible due to street/sidewalk re-paving, debris in B-Box, unable to locate due to initial measurement or data entry errors.

  - Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

    Data Source:

    Distribution Department manual

    Your Choice (weight: 0) --Valve inspections are conducted annually per Distribution Manual General Order 0.600

  - Review the guidance. (OTHRCSQ0)

    Your Choice (weight: 0) --Continue

- **Other (OTHR-1a) (Meters/Shutoffs Inaccessible - No Access to Meter or Shutoff)**
  - Interview Start (OTHR-1a)

    Your Choice (weight: 0) --Continue

  - Please describe the failures or problems. (OTHR110)

    Your Choice (weight: 0) --Meters or riser shutoffs may be inaccessible because of security fences, meters walled off in basements, locked rooms, concrete covering shutoff, etc.

  - Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

    Data Source:

    Distribution Manual Service Pipe Work Order 3.200 section III

    Your Choice (weight: 0) --Most inaccessible meters/riser shutoffs are found during Inside Safety Inspections, Turn On/Off activities or service renewals. The customer is notified that access to company facilities must be made available (cut out access panel, remove concrete, etc.) Meters are to be moved from the inside to the outside of the building whenever possible. AMRP or other renewal projects will move any meters outside the building if possible, allowing easier access.

  - Review the guidance. (OTHRCSQ0)

    Your Choice (weight: 0) --Continue

- **Other (OTHR-1a) (Incorrect Operations - Improper Odorization - Too Little or Much Mercaptin)**
  - Interview Start (OTHR-1a)

    Your Choice (weight: 0) --Continue

- Please describe the failures or problems. (OTHR110)

  Data Source:

  SME Alonzo Foster - Supervisory Engineer Gas Operations

  Your Choice (weight: 0) --If the odorant concentration level is too low, a gas leak may go undetected by sense of smell - leading to a potentially dangerous situation. If the concentration is too high, false leaks may be reported, diverting resources that would otherwise be able to respond to real emergencies.

- Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

  Data Source:

  SME Alonzo Foster - Supervisory Engineer Gas Operations

  Your Choice (weight: 0) --Odorant concentration levels are monitored and tested per the O&M Plan Exhibit III Gas Control and Odorization manual.

- Review the guidance. (OTHRCSQ0)

  Your Choice (weight: 0) --Continue

- **Other (OTHR-1a) (Corrosion - Cased Pipelines - Cathodic Protected Steel Pipelines inside Metallic Casings)**
  - Interview Start (OTHR-1a)

    Your Choice (weight: 0) --Continue

  - Please describe the failures or problems. (OTHR110)

    Data Source:

    SME Max Meredith - Supervisory Engineer Corrosion Control Group

    Your Choice (weight: 0) --There are 280 known cathodically protected steel mains and services (193 in the Distribution System) that are encased in either a steel or cast iron casing pipe. The threat stems from the chance of a short between the carrier and casing pipes, a short that would not be detected by standard pipe to soil inspections. The majority of the casings are pipelines that are both larger diameter and higher pressure than the rest of the distribution system as a whole. Additionally, most of the casings span difficult to reach areas (railroads/highways), so in the even of a leak, repair of the encased section of main would be extremely difficult.

  - Please describe any action you have taken (or plan to take) to address the failure previously entered. (OTHR111)

    Data Source:

    SME Max Meredith - Supervisory Engineer Corrosion Control Group

    Your Choice (weight: 0) --All casings and their respective carrier pipes are tested annually for isolation. If it is determined that a short between the structures exists, possible remediation actions are reviewed (re-insulation, removal of casing, retirement of carrier, etc.). Pending remediation projects are reviewed semi-weekly. Procedures Developed: Corrosion Control Order 8.210: Corrosion Inspection Procedure for Carrier/Casing Test Points Corrosion Control Order 8.220: ACVG Survey for Testing Carrier-Casing Isolation

  - Review the guidance. (OTHRCSQ0)

    Your Choice (weight: 0) --Continue

11.3. LIST OF DATA SOURCES FROM SHRIMP™ INTERVIEWS

DATA SOURCE REFERENCES

The following lists any data source references entered during the threat assessments.

- Corrosion (CORR) (PEOPLES GAS - Entire System)
    - PHMSA Annual Reports, compiled from R422 WAM Report
    - 2014 PHMSA Annual Report, compiled from Service and Main Facility WAM Reports
    - 2014 PHMSA Annual Report, compiled from Service and Main Facility WAM Reports
    - 2014 PHMSA Annual Report, compiled from Service and Main Facility WAM Reports
    - WAM Facility Reports and Corrosion SME Max Meredith
    - Atmospheric Corrosion (CORRAC) (PEOPLES GAS - Entire System)
        - PGL O&M Plan - Exhibit X - Corrosion Control Policy, Asset Manager
        - Cfirst - inside atmospheric corrosion found during ISI LKMS WAM Reports R104/109 Cleared Leaks Bridge & Tunnel - inspection form Exposed Pipe Surveys Regulator Station Inspections Answered by M. Meredith
        - Cfirst - inside atmospheric corrosion found during ISI LKMS WAM Reports R104/109 Cleared Leaks Bridge & Tunnel - inspection form Exposed Pipe Surveys Regulator Station Inspections Answered by M. Meredith
        - Cfirst - inside atmospheric corrosion found during ISI LKMS WAM Reports R104/109 Cleared Leaks Bridge & Tunnel - inspection form Residential Exposed Pipe Surveys (2005-2009 are averaged based on 2010-2014 totals) Regulator and Gate Station Leak Surveys Answered by M. Meredith
        - Cfirst - inside atmospheric corrosion found during ISI LKMS WAM Reports R104/109 Cleared Leaks Bridge & Tunnel - inspection form Exposed Pipe Surveys Regulator Station Inspections Answered by M. Meredith
        - Cfirst - inside atmospheric corrosion found during ISI LKMS WAM Reports R104/109 Cleared Leaks Bridge & Tunnel - inspection form Exposed Pipe Surveys Regulator Station Inspections Answered by M. Meredith
        - Cfirst - inside atmospheric corrosion found during ISI LKMS WAM Reports R104/109 Cleared Leaks Bridge & Tunnel - inspection form Exposed Pipe Surveys Regulator Station Inspections Answered by M. Meredith
        - Answered by M. Meredith
        - Inside Atmospheric Corrosion - ISI inpsection list from SPFS Engineer B, Martinkus. Outside Atmospheric Corrosion - WAM R45 Service Component Report Bridge and Tunnels - System Integrity Inspection Reports
        - Atmospheric Corrosion (CORRAC-1a) (Inside Atmospheric Corrosion - Inside Service Pipe)
            - WAM Facility Reports
            - Inside Safety Inspections that indicate existing corrosion.
            - CFirst - Inside Safety Inspections that indicate existing corrosion and resulting in a leak.
            - CFirst - Inside Safety Inspections that indicate existing corrosion and resulting in a leak.
            - CFirst - Inside Safety Inspections that indicate existing corrosion and resulting in a leak.
            - Wam Facility reports. Diameters within this section are generally 2" and less and medium and low pressures.
            - WAM Facility Reports- Majority of pipes within this section are residential.
            - CFirst Leak Response Time reporting.
            - This section relates to service pipes only.
        - Atmospheric Corrosion (CORRAC-1a) (Outside Atmospheric Corrosion - Outside Service Riser Pipe)
            - WAM Facility Reports.
            - WAM R99 Inspection Report. Exposed Pipe Inspections that resulted in a leak condition.

- WAM R99 Inspection Report. Exposed Pipe Inspections that resulted in a leak condition.
- 2005-2009 leak numbers are averaged. 2010-2014 leak numbers from exposed Pipe Inspections that resulted in a leak condition.
- WAM R99 Inspection Report. Exposed Pipe Inspections that resulted in a leak condition.
- Pipes within this section are services generally 2" or less and low and medium pressure.
- WAM Facility Reports
- CFirst Leak Response Time reporting.
- Section relates to service pipes only.

  - Atmospheric Corrosion (CORRAC-1a) (Bridges and Tunnels - Bridge and Tunnel Inspections)
    - WAM Facility Reports
    - Bridge and Tunnel Inspection Forms
    - Bridge and Tunnel Inspection Forms
    - Bridge and Tunnel Inspection Forms
    - Generally, pipelines that are crossing Bridges/Tunnels are larger size and/or pressure than the rest of the system as a whole. Answered by SME Max Meredith - Engineer Corrosion Control Group
    - Bridge and Tunnel Inspection Forms
    - Because of the inherent location of this section, reaching the point of the leak would take somewhat more time than a standard leak. Answered by SME Max Meredith - Engineer Corrosion Control Group
    - Generally, pipelines in this section are larger diameter and higher pressure than the rest of the system as a whole.

- External Corrosion (CORRECSTL-UB) (Unprotected, Bare Steel - Entire System)
  - From PHMSA Annual Reports (2010-2014)
  - {HMSA 7100 Reports for Facility data. LKMS Database for 2005-2009 Leaks WAM R104 for Corrosion Leaks Repaired (2010-2014).
  - LKMS Database, WAM Leak Reporting
  - R104/109 Cleared Leaks Report 2010-2014. Bare Steel Service Leaks divided by District (North=39.5%, Central=34.5%, South=25.9%)
  - WAM R104/109 Leak Reports
  - Suspected leaks on Buried Bare Steel are generally repaired immediately, with pipe renewal being the main method of repair.
  - R104/109 Cleared Leaks Report 2010-2014. Bare Steel Service Leaks divided by District (North=39.5%, Central=34.5%, South=25.9%)
  - Electric trains can cause stray current; however, stray current is not monitored on Non-corrosion protected facilities. Answered by M. Meredith
  - Stray current is not measured on Bare Steel Piping, so it not known if stray current has specifically caused leaks on bare steel pipe. Answered by M. Meredith
  - R43B WAM Report - 94% of all bare steel services <= 2" diameter. 99.3% of all bare steel services are Low Pressure (6" water column). There is no bare steel unprotected main piping in the system. Answered by M. Meredith
  - Generally, bare steel services are located on residential service pipes. WAM Facility Reporting
  - CFirst response time reports.
  - Section relates to service pipes only.
- External Corrosion (CORRECSTL-UC) (Unprotected, Coated Steel - Entire System)
  - PHMSA Annual Reports for Miles of Main. WAM R104 for Corrosion Leaks Repaired (2010-2014).

- Facility Data from PHMSA 7100 LKMS 2005-2009 WAM R104 for Corrosion Leaks Repaired (2010-2014)
- Main and Service Maintenance Tickets and Electronic Webforms capture exposed pipe condition.
- Per LKMS and WAM Leak Reports - There were only 16 unprotected coated steel leaks due to corrosion reported from 2005-2014. There is no perceived concentration.
- LKMS and R104/109 Cleared Leaks WAM Report
- Suspected leaks on Coated, unprotected steel is generally repaired immediately. Renewal of pipe is main method of repair.
- No concentration of leaks for this type from R104/109 WAM Reports
- Electric trains can cause stray current; however, stray current is not monitored on non corrosion protected pipes. Answered by M. Meredith
- Stray current is not measured on unprotected bare steel piping. Therefor, we cannot confirm that stray current has caused any corrosion leaks on this type of pipe. Answered by M. Meredith
- There are 177 unprotected, coated steel services in the PGL system. This number has not fluctuated greatly since 2005. Assume coating is in good condition or more services would have been repaired and changed to plastic.
- Of 177 services, 172 are <= 1.5" diameter. 168 are Low pressure (6"water column) Of the 1784 feet of main, 78% is 4" diameter HP and is located at O'Hare International Airport. The remaining is Low pressure.
- 78% of mains are at O'Hare International Airport, and are designated as residential, but treated as Business. Answered by M. Meredith.
- Cfirst leak response time reporting
- The majority of our unprotected, coated steel main runs at app. 55psi and is located at O'Hare International Airport per WAM facility reports.

- External Corrosion (CORRECSTL-PC) (Cathodic Protected, Coated Steel - Entire System)
  - PHMSA Annual Reports for Miles of Mains LKMS for Corrosion Leaks Repaired 2005-2009 WAM R104 for Corrosion Leaks Repaired (2010-2014)
  - Number of Services from PHMSA 7100 submitted reports. Number of corrosion leaks on Corrosion protected steel services from LKMS and R104/109 WAM Reports.
  - For Legacy System, Main Maintenance Tickets (form 216-A) & Service Pipe Order tickets (form 32) document visual inspections. These paper tickets are stored downtown. For WAM, webforms have a required pipe condition field. Very seldom is pipe condition poor for corrosion work on cathodically protected pipes. Answered by Max Meredith.
  - WAM reports R508BX Corrosion Main Inspection & R509BX Corrosion Service Inspection indicate very low percentage of readings below -0.85V. Question answered by M. Meredith
  - WAM Reports R508/509 indicate an even distribution of low CP reads among PGL's operating area. Question answered by M. Meredith.
  - R104/109 WAM Cleared Leaks Reports
  - No leaks currently being monitored are specifically suspected to be a result of corrosion.
  - R104/R109 WAM CLeared Leaks Report indicate no concentration of corrosion leaks within PGL's system.
  - WAM reports R508BX & R509BX. Answered by M. Meredith
  - Stray current possible from electric trains. Answered by M. Meredith
  - When stray current is observed, mitigation efforts are undertaken immediately. These include, but are not limited to, clearing shorts between facilities, installing anodes, and installing impressed current rectifiers. Question answered by M. Meredith
  - For Legacy System, Main Maintenance Tickets (form 216-A) & Service Pipe Order tickets (form 32) document visual inspections. These paper tickets are stored downtown. For WAM, webforms have a required pipe condition field. Very seldom is pipe condition poor for corrosion work on cathodically protected pipes. Answered by Max Meredith.
  - Answered by M. Meredith
  - Per WAM Facility Reports - For Mains, CP Steel pressure and size is generally larger diameter than PGL's system as a whole. For services, CP steel pressures are generally lower, but pipe diameters are generally larger than the system as

a whole. Answered by M. Meredith

- Per WAM facility reports, the majority of all services are found in residential areas.
- Cfirst leak response time reporting.
- From 2014 PHMSA form 7100, steel mains are approx 26% of total main miles and approx 8% of total services. Answered by M. Meredith

- External Corrosion (CORRECOTHR) (Other Metal - Entire System)
  - Copper Services
  - From PHMSA Annual Reports (2010-2014)
  - PHMSA Annual Reports for Number of Services LKMS for leaks repaired 2005-2009 WAM R104 for Corrosion Leaks Repaired on copper services. (2010-2014)
  - LKMS Database, WAM Leak Reporting
  - WAM Reports R109/104 Cleared Leaks - Leaks repaired due to corrosion on copper services are generally uniform. Answered by M. Meredith
  - WAM Reports R109/104 Cleared Leaks
  - There are no currently pending leaks that are specifically suspected to be a result of corrosion.
  - Per R104/109 Wam Reports for cleared leaks, leaks on copper services due to corrosion are company wide. Answered by M. Meredith
  - Answered by M. Meredith
  - PHMSA form 7100. Answered by M. Meredith
  - Possibly. Per WAM Facility Reports, Mains and service risers are made of dissimilar metals.
  - Generally all copper services are 1.25" diameter. 95% are low pressure. (6" water column) per WAM facility Reports
  - Per WAM Facility reports, majority of copper services are in residential areas.
  - Cfirst leak response time reporting
  - From PHMSA form 7100, copper services represent approx. 2.5% of all PGL services.
- External Corrosion (CORRECCDWI) (Cast, Ductile, Wrought Iron (8" or smaller) - Entire System)
  - 2005-2009 miles of main are from PHMSA 7100. 2005-2009 corrosion leaks from LKMS database. 2010-2015 Miles of Main from WAM Report R43. Number of leaks from WAM Report R104/109
  - 2005-2014 number of services are from PHMSA 7100. 2005-2009 number of corrosion leaks are from LKMS. 2010-2014 leaks from WAM R104/109 Leak Cleared Report
  - Only 1 leak repaired in last 5 years due to corrosion from WAM database for Services. Mains do have corrosion issue.
  - Per WAM R104/109 Leak reports - Corrosion leaks for CI/DI mains and services are generally found system wide.
  - LKMS and WAM Leak Reports
  - Pending leak reports do not include suspected leak cause.
  - WAM R104/109 Leak Reports
  - Possible lamp stubs.
  - WAM 104/109 Leak Reporting
  - WAM Reports R104/109 Leak Cleared Reporting
  - Pipe condition on Maintenance Tickets.
  - The vast majority of CI/DI pipelines of diameter 8" or less are Low Pressure (6" water column) per WAM Facility Reports.
  - Per WAM Facility Report R43A, approximately 85% of mains within this section are designated as residential.

- Per CFirst Leak Response Time reporting.
- From 2009 PHMSA form 7100 <=8" dia CI/DI mains are approx 26% of total PGL main mileage.

- External Corrosion (CORRECCDWIL) (Cast, Ductile, Wrought Iron (larger than 8") - Entire System)
  - PHMSA Annual Reports for Miles of Mains (2005-2014). LKMS database for corrosion leaks repaired (2005-2009) WAM R109 for Corrosion Leaks Repaired (2010-2014)
  - PHMSA Annual Reports for Number of Services. Legacy LKMS Database for Corrosion Leaks Repaired (2005-2009). WAM Report R104/109 Cleared Leak Report.
  - LKMS database - Main leaks. WAM Reporting
  - From LKMS and WAM databases there were no CI, DI larger than 8" Service leaks. Main leaks did occur at each shop.
  - Per LKMS database & WAM database.
  - Pending Leak reports do not indicated suspected cause of leak.
  - LKMS database and WAM database
  - Lamp Stubs.
  - WAM R104/109 Cleared Leak Reports
  - WAM R104/109 Cleared Leak Reports
  - By Section definition, these are the larger size mains and services. Per WAM Report R43A ,these larger mains & services may be low or medium pressure.
  - Per R43A, approximately 54% of Cast/Ductile Iron mains this size are designated as Business Mains.
  - Cfirst Report - Leak Response Time Reporting.
  - By definition, this section pertains to larger diameter mains and services.
- Internal Corrosion (CORRIC) (PEOPLES GAS - Entire System)
  - Per O&M Plan Exhibit X Corrosion Control Policy, Section VI, updated 3/11/2015, Internal Corrosion for Peoples Gas within the city of Chicago is not an issue at this time.
  - WAM R104/109 Leak Reports
  - Per O&M Plan Exhibit X Corrosion Control Policy
  - Strictly water in LP pipelines.
  - Water infiltration is generally concentrated to Low Pressure Cast/Ductile Iron mains. No record of corrosive elements.
  - Concentrated within PGL's low pressure cast and ductile iron mains and services.
  - Water infiltration is generally concentrated to Low Pressure Cast/Ductile Iron mains. Main sizes are representative of PGL's system mains as a whole.
  - WAM Facility Reports
  - Cfirst leak response time reports.
  - Section pertains to LP areas of the distribution system specifically.

- Equipment Malfunction (EQIP) (PEOPLES GAS - Entire System)
  - Interview held with Gas Operations Department Engineers and Supervisors
  - PHMSA Annual Reports
  - Per WAM R104/109 Leak Reports and vault inspeciton results. Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Any industry wide failure prone equipment would be brought to company attention through bulletins from Tech Training and Standards Group. Answered by SME Alonzo Foste, Supervisory Engineer Gas Operations
  - Other Equipment Experiencing Failure (EQ-FailO) (Failing Equipment - Other)

- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Specific Other Equipment Experiencing Failure (EQ-FailO-1a) (Gate Stations - All Gate Stations)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - In 2014, 24" Crawford Meter Run had blown gasket on flange and needed to be replaced. Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Back up generators are in place for all gate stations. Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Highly unlikely due to monitoring by Gas Control and over-pressurization controls. Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations.
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Gate Station Piping is substantially larger size and pressure than the rest of the system as a whole. Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Gate Stations are located outside business districts.
  - CFirst Leak Response Time Report
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Specific Other Equipment Experiencing Failure (EQ-FailO-1a) (Medium Pressure Vaults - High Pressure to Medium Pressure Vaults)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - CFirst Leak Response Time Report
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Specific Other Equipment Experiencing Failure (EQ-FailO-1a) (Low Pressure Vaults - Medium Pressure to Low Pressure Vaults)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations

- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- CFirst Leak Response Time Report
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations

- Specific Other Equipment Experiencing Failure (EQ-FailO-1a) (High Pressure to High Pressure Stations - High Pressure to High Pressure Station)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - CFirst Leak Response Time Report
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations

- Other Equipment Experiencing Failure (EQ-FailO) (Failing Equipment - Heaters)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Back up Generators are located at stations that include Cold weather technology field heaters. Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Valves Experiencing Failure (EQ-FailV) (Failing Equipment - Valves)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Specific Valves Experiencing Failure (EQ-FailV-1a) (Service Valves - All Service Valves)
    - Service Line valves are not inspected.
    - WAM R104/109 Leak Reports
    - WAM R104/109 Leak Reports
    - WAM R104/109 Leak Reports

- Per SME panel - service valves are usually operable.
- Per SME panel.
- Section pertains specifically to service line valves.
- Section pertains specifically to service line valves, of which the vast majority are residential per WAM Facility Reports.
- CFirst Leak Response Time Report
- This section pertains specifically with service line valves.

- Specific Valves Experiencing Failure (EQ-FailV-1a) (Distribution Valves - Distribution Valves Not Located in Basins)
  - O&M Manual Exhibit I, Distribution Dept. Manual, General Order 0.600
  - Per WAM Report R108 Valve Inspection List
  - Per WAM Report R108 Valve Inspection List
  - WAM R104/109 Leak Reports
  - WAM R104/109 Leak Reports
  - This section deals specifically with isolation type valves.
  - WAM R104/109 Leak Reports
  - WAM R104/109 Leak Reports
  - This section pertains to valves of sizes smaller than 4" diameter.
  - WAM Facility Reports
  - CFirst Leak Response Time Report
  - This section pertains to valves smaller than 4" diameter. Answered by SME Alonzo Foster.
- Specific Valves Experiencing Failure (EQ-FailV-1a) (Network Valves - All Network Valves)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - O&M Plan (Exhibit XII) Gas Operations Section Manual, Chapter 5, Section 2
  - WAM Report R108 Valve Inspection List
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - WAM R104/109 Leak Database
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - These valves are located within basins, and PGL Leak Classification states all confined space leaks are Class 1. Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - WAM Facility Reports
  - CFirst Leak Response Time Report
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Specific Valves Experiencing Failure (EQ-FailV-1a) (Remote Oper Valves - All Remote Op Valves)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - O&M Plan (Exhibit XII) Gas Operations Section Manual, Chapter 5, Section 5

- WAM R108 Valve Inspection List and SME Alonzo Foster
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- WAM R104/109 Leak Reports Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- WAM Facility Reports
- CFirst Leak Response Time Report
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations

- Specific Valves Experiencing Failure (EQ-FailV-1a) (Kerotest Valve - Kerotest Valve (Kerotest, Prior to Mid 1980's))
  - WAM R108 Valve Inspection List
  - WAM R108 Valve Inspection List. Per SME Panel, generally, the bolts on the underside of the valve corrode.
  - WAM R108 Valve Inspection List. Per SME Panel, generally, the bolts on the underside of the valve corrode.
  - WAM 104/109 Leak Repair Database
  - WAM 104/109 Leak Repair Database
  - These are isolation valves.
  - WAM 104/109 Leak Repair Database
  - WAM 104/109 Leak Repair Database
  - This section pertains specifically to valves less than 4" diameter.
  - WAM 104/109 Leak Repair Database
  - Cfirst Leak Response Time Report
  - This section pertains specifically to valves less than 4" diameter.
- Specific Valves Experiencing Failure (EQ-FailV-1a) (Security Valves - Slam Shut Security Valves)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations

- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
- CFirst Leak Response Time Report
- Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations

- Specific Valves Experiencing Failure (EQ-FailV-1a) (Gas Operations Distribution Valves - Distribution Valves Located Inside Valve Basins)
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - WAM R108 Valve Inspection List Report
  - WAM R108 Valve Inspection List Report
  - WAM R104/109 Leak Report
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations
  - WAM Facility Reports
  - CFirst Leak Response Time Report
  - Answered by SME Alonzo Foster, Supervisory Engineer Gas Operations

- Incorrect Operations (IOP) (PEOPLES GAS - Entire System)
  - PHMSA Annual Reports
  - Per Tech Training, O&M Plan Exhibit I, Distribution Manual General Order 3.000 PROCEDURE FOR PRESSURE TESTING MAINS, BY-PASS PIPING AND SERVICE PIPES. Also O&M Plan Exhibit II Field Service Manual, Section 15 Working On Gas Piping Inside Premises (Bond Wire).
  - LKMS and WAM Cleared Leaks Databases.
  - Tech Training Disqualification Sheet
  - Human Resources
  - Drugs and Alcohol (IOP-Drug) (PEOPLES GAS - Entire System)
    - First Advantage Database via HR contact Sandra Hallock.
    - First Advantage Database via HR contact Sandra Hallock.
    - First Advantage Database via HR contact Sandra Hallock.
  - Failure To Follow Procedures (IOP-Follow) (PEOPLES GAS - Entire System)
    - WAM Leak Database
  - Inadequate Procedures (IOP-Proc) (PEOPLES GAS - Entire System)
    - Per Tech Training. O&M Plan Exhibit I, Distribution Manual General Order 3.000 Procedure for Pressure Testing Mains, By-Pass Piping, and Service Pipes. Also, O&M Plan Exhibit II Field Service Manual, Section 15 Working on Gas Piping Inside Premises (Bond Wire).
    - Procedures are evaluated/reviewed annually.
  - Operator Qualification Revocation (IOP-Qual) (PEOPLES GAS - Entire System)
    - Tech Training Disqualification Sheet

- Tech Training Disqualification Sheet.
- Tech Training Disqualification Sheet.

- Material, Weld or Joint Failure (MW) (PEOPLES GAS - Entire System)
  - Interview held with SME William Good, Supervisory Engineer, PGL Compliance Group
  - PHMSA Annual Reports
  - WAM R104/109 Leak Reports
  - SME William Good, Supervisory Engineer, PGL Compliance Group
  - SME William Good, Supervisory Engineer, PGL Compliance Group Material Failure Database
  - Tech Training - Charlie Bair
  - Known Materials (MW-Matl) (Known Material - Compression Couplings for PE Pipe)
    - SME William Good, Supervisory Engineer, PGL Compliance Group Material Failure Database LKMS Database (2006-2009) WAM R104/109 Leak Reports
    - Material Failure Reports - PHMSA For years 2005 through 2009, Legacy leak data does not provide sufficient enough information to discern if a leak was on a plastic compression fitting. Therefore, a value of (7) was entered, which was the average number of leaks for years 2010 through 2014, in which reliable data was available.
    - LKMS Database (2006-2009) WAM R104/109 Leak Reports
    - Electrofusion is the preferred method for joining plastic pipe. SME William Good, Supervisory Engineer, PGL Compliance Group
    - Integrys Standard 1030 - Pressure Testing
    - SME William Good, Supervisory Engineer, PGL Compliance Group
    - SME William Good, Supervisory Engineer, PGL Compliance Group
    - WAM Facility Reports and SME William Good, Supervisory Engineer, PGL Compliance Group
    - CFirst Leak Response Time report.
    - WAM R104/109 Leak Reports. Plastic compression fittings are generally located on service pipes.
  - Manufacturing Defects (MW-Mfg) (Service Pipe - Clear Plastic)
    - This threat interview addresses the specific material defects with respect to Clear Plastic, and not necessarily any manufacturing defect.
    - LKMS database average 1/per year for 2005-2009 WAM R104/109 Leak Reports
    - WAM R104/109 Leak Reports Material Failure Reports - PHMSA For years 2005 through 2009, Legacy leak data does not provide sufficient enough information to discern if a leak due to material failure was on a clear plastic service. Therefore, a value of (14) was entered, which was the average number of leaks for years 2010 through 2014, in which reliable data was available.
    - LKMS Database (2006-2009) WAM R104/109 Leak Report
    - We no longer install Clear Plastic Services. SME William Good, Supervisory Engineer, PGL Compliance Group
    - Integrys Standard 1030 - Pressure Testing
    - WAM R104/109 Leak Reports. Approximately 30% of clear plastic service leaks are initially graded as Grade 1.
    - Section pertians specifically to service piping. SME William Good, Supervisory Engineer, PGL Compliance Group
    - Section pertains specifically to service piping. SME William Good, Supervisory Engineer, PGL Compliance Group
    - CFirst Leak Response Time Report
    - Section pertains specifically to service piping. SME William Good, Supervisory Engineer, PGL Compliance Group
  - Manufacturing Defects (MW-Mfg) (Fittings - Mechanical Joint)

- This threat interview addresses the specific material defects with respect to Mechanical Joints, and not any manufacturing defect.
- LKMS Database (2006-2009) WAM R104/109 Leak Reports
- WAM R104/109 Leak Reports Material Failure Reports - PHMSA For years 2005 through 2009, Legacy leak data does not provide sufficient enough information to discern if a leak due to material defect was on a mechanical fitting. Therefore, a value of (63) was entered, which was the average number of leaks for years 2010 through 2014, in which more reliable data was available.
- LKMS Database (2006-2009) WAM R104/109 Leak Reports
- There have not been specific procedure changes or specification updates for the use or installation of mechanical fittings.
- Integrys Standard 1030 - Pressure Testing
- LKMS Database (2006-2009) WAM R104/109 Leak Reports
- SME William Good, Supervisory Engineer, PGL Compliance Group Material Failure Database
- SME William Good, Supervisory Engineer, PGL Compliance Group Material Failure Database
- CFirst Leak Response Time Report
- SME William Good, Supervisory Engineer, PGL Compliance Group Material Failure Database

- Excavation Damage (OFEXC) (PEOPLES GAS - Entire System)
  - City of Chicago uses DIGGER.
  - PHMSA Annual Reports
  - Hit Database is not currently used to capture excavation damages that did not result in a leak. Answered by System Integrity Manager Vip Kapoor.
  - Estimates for 2005-2006 from previous DIMP entries. PHMSA Annual Reports (2007-2014)
  - While we do accept the determination of decreased excavation damages, WAM cleared leak reports R104/109 do not necessarily reflect the data that is in the System Integrity Hit Database. Answered by Manager System Integrity Vip Kapoor.
  - Blasting Damage (OFEXC-Blast) (PEOPLES GAS - Entire System)
    - WAM Reports and SME knowledge. Answered by Manager System Integrity Vip Kapoor.
    - WAM Reports and SME knowledge. Answered by Manager System Integrity Vip Kapoor.
    - WAM Reports and SME knowledge. Answered by Manager System Integrity Vip Kapoor.
  - Concentrated Damages (OFEXC-Conc) (PEOPLES GAS - Entire System)
    - PHMSA 7100 Annual Reports
    - PGL Hit Database - Hits to company facilities are generally distributed evenly across all three districts. Answered by V. Kapoor SME Manager System Integrity.
    - PGL Facilities Damage Database. Locate requests are generally distributed among the city evenly. Answered by V. Kapoor SME Manager System Integrity.
    - Answered by V. Kapoor SME Manager System Integrity.
  - Crew or Contractor Damages (OFEXC-Crew) (PEOPLES GAS - Entire System)
    - PGL Facilities Damage database
    - PGL Hit Database
    - PGL Facilities Damage database
    - PGL Facilities Damage database
    - No record of this cause in PGL Hit Database
    - PGL Facilities Damage database

- PGL Facilities Damage database
- PGL Facilities Damage database
- Answered by SME Manager System Integrity Vip Kapoor. Decision was made to section by 1st party hits and 2nd party hits.
- PGL Facilities Database
- Crew or Contractor Damages (OFEXC-Crew-1a) (Peoples Gas - Damages to PGL facilities by PGL Crews (Peoples Gas))
  - Only one instance of this over the past 10 years. Answered by SME Vip Kapoor, Manager of System Integrity. Data source PGL Facilites Damage Database.
  - No record of this cause in PGL Hit Database
  - PGL Facilities Damage Database
  - Facilities Damage Database
  - PGL Facilities Damage database
  - Facilities Damage Database and PHMSA Incident Reporting.
  - Answered by V. Kapoor SME Manager System Integrity.
- Crew or Contractor Damages (OFEXC-Crew-1a) (Peoples Gas Contractors - Damages to PGL facilities by 2nd Parties (Peoples Gas Contractors))
  - PGL Facilities Damage Database
  - No record of this cause in PGL Facilities Damage Database
  - PGL Facilities Damage Database
  - PGL Facilities Damage Database
  - PGL Facilities Damage Database
  - Incident ID 20120038-15571. On 12/1/2011, while performing Pipeline Integrity Work, NPL damaged an unmapped 2" HP service pipe. Originally reported as a Distribution Incident, but later changed to Transmission.
  - Answered by V. Kapoor SME Manager System Integrity.

- Third Party Damages (OFEXC-Third) (PEOPLES GAS - Entire System)
  - Facilities Damage Database & LKMS database
  - PGL Facilities Damage Database. No reliable info for 2005. Answered by William Houghton
  - Answered by V. Kapoor SME Manager System Integrity.
  - Facilities Damage Database
  - Nothing in Facilities Damage Database or Performance Metrics about poorly performing locating equipment. Answered also by William Houghton.
  - Facilities Damage Database & Performance Metrics Spreadsheet.
  - Facilities Damage Database
  - Facilities Damage Database & Performance Metrics Spreadsheet
  - Decision to list these three parties is based on the high number of hits they cause vs. total hits. Answered by V. Kapoor SME Manager System Integrity.
  - Third Party Damages (OFEXC-Third-1a) (City of Chicago, Water - Chicago Water Dept)
    - PGL Facilities Damage Database
    - No mention of poorly performing locate equipment in PGL Facilities Damage Database.
    - PGL Facilities Damage Database

- PGL Facilities Damage Database
- PGL Facilities Damage Database
- PGL Facilities Damage Database shows City of Chicago Water Department is responsible for app. 37% of all 3rd party damages annually.

- Third Party Damages (OFEXC-Third-1a) (Benchmark Construction - Water Main Installation Contractor for City of Chicago)
  - PGL Facilities Damage Database
  - No mention of poorly performing locating equipment in PGL Facilities Damage Database
  - PGL Facilities Damage Database
  - PGL Facilities Damage Database
  - PGL Facilities Damage Database
- Third Party Damages (OFEXC-Third-1a) (Joel Kennedy Construction - Water Main Installation Contractor for City of Chicago)
  - PGL Hit Database
  - PGL Hit Database
  - PGL Hit Database
  - PGL Hit Database

- Natural Forces (OFNF) (PEOPLES GAS - Entire System)
  - PHMSA Annual Reports
  - Data not available.
  - WAM R104/109 Leak report
  - WAM R43A Facility Reporting.
  - R104/109 WAM Cleared Leak Reports
  - R104/109 WAM Cleared Leak Reports
  - R104/109 WAM Cleared Leak reporting.
  - Concentrated Area (OFNF-1a) (Entire System - Entire System Except 6" Diameter Cast Iron Mains)
    - 2005-2009, Natural Force leaks for this section (non 6"CI) normalized against known leaks for 2010-2014. Approximately 42% of leaks were on non 6"CI for those years. 2010-2014 leaks from WAM R104/109 Cleared Leak Reports.
    - Flood areas near Chicago River.
    - WAM R104/109 Cleared Leaks Report
    - WAM R104/109 Cleared Leaks Report
    - This section reflects PGLS's system as a whole.
    - This section reflects PGLS's system as a whole. WAM Facility Reports
    - CFirst Leak Response Time Reporting.
    - This section reflects PGLS's system as a whole.
  - Concentrated Area (OFNF-1a) (6" Cast Iron Mains - 6" Diameter Cast Iron Mains)
    - 2005-2009, Natural Force leaks for this section (6"CI Main) normalized against known leaks for 2010-2014. Approximately 58% of leaks were on 6"CI Mains for those years. 2010-2014 leaks from WAM R104/109 Cleared Leak Reports.
    - Flooding near Chicago River

        - Section is specifically for 6" CI
        - R104/109 WAM Cleared Leak Report
        - Section is specifically for 6" CI Main
        - Section is specifically for 6" CI, which is slightly larger diameter than system mains and services as a whole.
        - Approximately 93% of 6" CI Mains are designated as Residential per R43A WAM reports.
        - CFirst Leak Response Time Reporting.
        - Natural Force Leaks on 6" CI Mains account for approximately 55% of total number of natural force leaks.
- Other Outside Forces (OFOTHR) (PEOPLES GAS - Entire System)
    - PHMSA Annual Reports
    - Data not available.
    - LKMS database and WAM R104/109 Leak Cleared Reports
    - LKMS database and WAM R104/109 Leak Cleared Reports
    - LKMS database and WAM R104/109 Leak Cleared Reports
    - Other Outside Forces (OFOTHR-1a) (Other Outside Force Damage - Services - Other Outside Force Damages on Service Pipes)
        - LKMS and WAM Leak Reporting Databases
        - LKMS and WAM Leak Reporting Databases
        - LKMS and WAM Leak Reporting Databases
        - LKMS and WAM Leak Reporting Databases
        - This section (service pipes) is generally representative of PGL's system as a whole.
        - This section (service pipes) is predominantly designated as residential.
        - CFirst Leak Response Time Reporting.
    - Other Outside Forces (OFOTHR-1a) (Other Outside Force Damage - Mains - Other Outside Force Damages on Main Pipes)
        - LKMS and WAM Leak Reports
        - LKMS and WAM Leak Reports
        - No record of malicious acts against main pipe in LKMS or WAM database observations.
        - This section (main pipe) is generally larger diameter/higher pressure than the system as a whole.
        - Approximately 80% of main pipe is classified as residential piping per R43 WAM Report.
        - Cfirst Leak Response Time Reporting.
- Other Threats (OTHR) (PEOPLES GAS - Entire System)
    - LKMS and WAM database cause codes = "Other"
    - Other (OTHR-1a) (Bell Joints & Mechanical Joints - Leaking Main Bell & Mechanical Joints Due to Age)
        - LKMS database WAM R104/109 Cleared Leak Report
        - LKMS/WAM database remarks section, management directive and procedures.
    - Other (OTHR-1a) (Excavation Damage - Critical Facilities - Excavation near HP Pipelines, >=16" MP Pipelines, Vaults, Remote Operated Valves, and Current Rectifiers)
        - SME Vip Kapoor, Manager System Integrity
        - SME Vip Kapoor, Manager System Integrity
    - Other (OTHR-1a) (Incorrect Operations - Non-Approved Material - Installation of Non-Approved Materials)

- SME William Good - Supervisory Engineer Compliance Group
- SME William Good - Supervisory Engineer Compliance Group

- Other (OTHR-1a) (Other Outside Force - Occupant Use - Unauthorized Turn-on By Customer)
  - SME Engineer Brian Martinkus, Field Service Planning
  - SME Engineer Brian Martinkus, Field Service Planning
- Other (OTHR-1a) (Excavation Damage - Inactive Services - Service Pipes Designated as Inactive)
  - Interview held with SME Nicholas Wood, Engineer Distribution Planning
  - SME Nicholas Wood - Engineer Distribution Planning PGL Hit Database
  - SME Nicholas Wood - Engineer Distribution Integrity
- Other (OTHR-1a) (Other - Soft Closed Accounts - Supply to Vacant Property Remaining Active)
  - SME Glannie Chan - Supervisory Engineer Compliance Group
  - SME Glannie Chan - Supervisory Engineer Compliance Group
- Other (OTHR-1a) (Inaccessible Valves - Paved Over, Dirt in B-Box)
  - Distribution Department manual
- Other (OTHR-1a) (Meters/Shutoffs Inaccessible - No Access to Meter or Shutoff)
  - Distribution Manual Service Pipe Work Order 3.200 section III
- Other (OTHR-1a) (Incorrect Operations - Improper Odorization - Too Little or Much Mercaptin)
  - SME Alonzo Foster - Supervisory Engineer Gas Operations
  - SME Alonzo Foster - Supervisory Engineer Gas Operations
- Other (OTHR-1a) (Corrosion - Cased Pipelines - Cathodic Protected Steel Pipelines inside Metallic Casings)
  - SME Max Meredith - Supervisory Engineer Corrosion Control Group
  - SME Max Meredith - Supervisory Engineer Corrosion Control Group

11.4. DESCRIPTION OF THE PROCESS FOLLOWED TO DEVELOP THIS PLAN

11.4.1. Process Description

Procedures for developing and implementing DIMP elements using SHRIMP

Creating a written DIMP Plan using SHRIMP should follow the steps shown in the SHRIMP process diagram. Each step should be completed before moving on to the next step.

Figure 11.1. SHRIMP Process Diagram

1. **Enter/confirm system information**

   If your system filed a Distribution Annual Report (Form 7100.1-1) you should find your system data already entered into SHRIMP. Note, this may not be the most current data – at the time SHRIMP was created only the annual reports for 2009 were available. This information is shown only to allow you to confirm that this is your system – it is not used for any other purpose in SHRIMP.

   If your annual report data is not already entered in SHRIMP, e.g. you are a master meter or LP piping system operator that is not required to file annual reports, or your annual report is missing from PHMSA's database, you must enter the data manually.

2. **Select settings**

   The next step is to enter settings for your plan. These include:

   - The name of your system as you want it to appear in the plan,
   - A description of what part of your system this plan covers (default is entire system),
   - The effective date of the plan (for your first plan this should be no later than August 2, 2011 as required by the DIMP rule),
   - The effective date of the DIMP Plan replaced by this Plan – SHRIMP automatically generates this,
   - The History Period – this is how many years back you will enter inspection and maintenance data such as leak repairs, line locate tickets, etc. in the threat interviews. The default and minimum is 5 years and but you can change this to up to 10 years if you have the data. More years data = better DIMP plans.
   - A LEAK management policy – Either select one of the two pre-written options in SHRIMP or if you already have a leak management plan that meets the rule's requirements enter a cross reference to that policy, and
   - A program re-evaluation period, anywhere from 1 to 5 years.

   You can go back and change these at any time by clicking on the Required Settings link in the menu bar on the left side of SHRIMP screens

3. **Complete threat interviews**

SHRIMP uses an interview process to assess each of the eight threats required by the DIMP rule. The 8 threats are:

1. Corrosion
2. Equipment Malfunction
3. Incorrect Operations
4. Material, Weld or Joint Failure
5. Excavation Damage
6. Natural forces
7. Other outside forces
8. Other Threats

Some of the threats are broken down into two or more subthreats. You must complete each threat and subthreat interview before going to Steps 4 and beyond. You can go back and change any of the information you provide in the threat interviews by clicking on the System Overview link on the menu then clicking on the blue "Review" link next to the threat interview in which you wish to make changes. Select the blue question number link by the question and the interview form will open. Make changes, but you may have to re-complete all of the interview questions after that question if your change affects answers to later questions. This is described in more detail later in this users guide.

Note

You can complete the first seven threat interviews in any order, however you MUST complete the first seven interviews before attempting to complete the "Other Threats" interview. The answers you provide in the Other Threats interview depend on the answers you provided in the other 7 threat interviews.

The threat interviews are intended to satisfy the following two requirements of the DIMP rule: Section 192.1007 (a) Knowledge and (b) Identify Threats. These requirements and the procedure followed by SHRIMP are further described in an attachment to this document.

4. **Validate Risk Rankings**

After all 8 threat interviews have been completed SHRIMP will rank each threat and section by relative risk, from highest to lowest, based on a numerical model that considers the likelihood and consequences were a segment of your system to fail due to the threat. A complete description of this risk ranking model is found in an appendix to this user's guide and an attachment to your written DIMP Plan created by SHRIMP.

Click on Risk Ranking in the left menu to open the risk ranking screen. If you entered any threats in the "Other Threats" interview those threats will be listed first with no assigned rank. These threats MUST be manually placed by the user where the user feels these threats belong in the list of threats. The process for that is described in further detail in the risk ranking section of the user's guide. You should not automatically accept SHRIMP's order of risk ranking. Review it, consider the summary description of why SHRIMP ranked each threat and, if you disagree with the order, rearrange the order of threats as you believe it should be, and be sure to enter a description of what factors you considered that led you to change the order. **This is a very important step!**

The risk ranking validation process is intended to satisfy the following requirement of the DIMP rule: Section 192.1007 (c) Evaluate and rank risk.

5. **Select Additional Actions***

After you are satisfied that all threat-sections are ranked in the correct order, the next step is to select additional actions you will undertake to reduce those threats. Additional actions means actions above and beyond what is required by pipeline safety regulations. Other than implementing a leak management program, the DIMP rule does not presume that any further additional actions are necessary. You must decide whether any of the threats pose a level of risk that warrants additional action. SHRIMP cannot make that determination. There is additional guidance on selecting additional actions in the additional actions section of this user's guide.

SHRIMP offers at least one additional action for each threat. Click on the blue Choose AAs link in the Risk Ranking screen to display a list of possible additional actions for that threat. If you decide additional actions are warranted you can select one or more of SHRIMP's additional actions or you can create your own by clicking on the Manage AAs link in the left-side menu in SHRIMP.

This step is intended to satisfy the following requirement of the DIMP rule: Section 192.1007 (d) Identify and implement measures to address risks.

6. **Select Performance Measures**

The next step is to select performance measures for each of the additional actions you selected in Step 5. If you didn't feel any threats warranted additional actions you can skip this step.

The process of selecting performance measures is identical to selecting additional actions in the prior step. Click on the Choose PMs link then select one or more of the displayed, threat-specific performance measures. You can create your own performance measures by clicking on Manage PMs in the left-side menu.

This step is intended to satisfy the following requirement of the DIMP rule: Section 192.1007 (e) Measure performance, monitor results and evaluate effectiveness.

7. **Create Implementation Plan**

   Now you are ready to review the actions required to implement your written DIMP plan. All of the actions required by the rule or selected by you in the additional actions and performance measures steps can be displayed by clicking on "Implementation Plan" in the left-side menu. The Implementation Plan should answer the questions of Who, What, When, Where and How each required action will be accomplished. Action items in your written DIMP Plan can be summarized in the following areas:

   1. Describing how you will modify your procedures, policies and recordkeeping system(s) as necessary to collect and retain information required to be collected and retained under the DIMP plan, including mandatory performance measures and performance measures you selected in the previous step, and

   2. Describing how you will implement any Additional/Accelerated Actions that you included in your written DIMP plan.

   Each action item will be listed separately with a text box in which you must enter a description of how you will accomplish this action.

8. **Download your written DIMP Plan**

   When you are satisfied that Steps 1-7 are complete you should download your written DIMP plan to your computer. Click on Written Plan in the left-side menu and a list of download options will be displayed.

   Review the Required Settings one more time to ensure your system name appears as you want it to appear in your Plan and that the other information is correct.

   Click on Web Page Format to display the written plan on your web browser. You can do this at any time during the process of creating your plan to see how selections you have made up to that point affect what is written into your plan. It is recommended that you look at the Plan in the Web Page Format frequently as you work on Steps 1-7 to see how data you enter appears in your Plan – it may affect how you write some text that will go into your Plan.

   You may save your plan to your computer as a Web Page using the Save command on your web browser.

   Click on Microsoft WORD Document to download your plan as a WORD file that you can edit using Microsoft WORD or other word processing software. (Note that the translator that creates this file may loses some formatting of the Table of Contents and other portions of the Plan. We apologize for any inconvenience this may cause you. We are evaluating other options for creating WORD files.)

   Click on Adobe PDF Format to download you written Plan as an Adobe PDF file.

SHRIMP Procedures Compared To DIMP Rule Requirements

This section describes the procedures to be followed to develop and implement the 7 required elements of the Distribution Integrity Management Programs (DIMP) written Plan. For each required element the text of the DIMP rule is provided, followed by a description of the procedure to develop and implement that element.

a. Knowledge

   The Rule: An operator must demonstrate an understanding of its gas distribution system developed from reasonably available information.

   1. Identify the characteristics of the pipeline's design and operations and the environmental factors that are necessary to assess the applicable threats and risks to its gas distribution pipeline.

   2. Consider the information gained from past design, operations, and maintenance.

   3. Identify additional information needed and provide a plan for gaining that information over time through normal activities conducted on the pipeline (for example, design, construction, operations or maintenance activities).

   4. Develop and implement a process by which the IM program will be reviewed periodically and refined and improved as needed.

   5. Provide for the capture and retention of data on any new pipeline installed. The data must include, at a minimum, the location where the new pipeline is installed and the material of which it is constructed.

   The Procedure: (Numbers in parenthesis refer to the requirements shown above)

   (1 & 2) During the 8 threat assessments SHRIMP asks questions about the user's system design, operations and environmental

factors necessary to assess the applicable threats and risks to distribution pipeline integrity. The user should refer to current and past design, construction, operation, inspection and maintenance records, as well as the knowledge of utility personnel to accurately answer questions posed by SHRIMP. SHRIMP includes a Data Source field with each question for the user to record the source of information used to answer each question. Information entered into this field will be included in an attachment to the written DIMP plan along with a complete list of questions answered during the SHRIMP process. Where past data is requested by SHRIMP, a minimum of the previous 5 years' data is requested, however if more than 5 years' data is readily available the user is encouraged to use that data as well.

In addition, during the Risk Ranking Validation step, the user should consider any additional factors that may affect the probability and/or consequences of a failure of a particular section of distribution piping but that were not asked about by SHRIMP. Examples could include pipe located near hospitals, schools, nursing homes or other difficult to evacuate facilities; environmental factors such as soil corrosivity; and more. During the Risk Ranking Validation step, any additional knowledge considered by the user to change the relative risk ranking of any section should be described in the text box provided by SHRIMP. This description will be written into the written DIMP Plan in the Risk Ranking section.

(3) If any of the design, construction or environmental factors requested by SHRIMP are not readily available the user should answer "I don't know." SHRIMP will then offer pre-written text describing how the user will gain that information over time through normal activities conducted on the pipeline. The user can accept SHRIMP's plan or enter their own description of how that knowledge will be gained. The SHRIMP text or the user's text will be included in the written DIMP plan.

(4) A process by which the IM program will be reviewed periodically and refined and improved as needed using SHRIMP is under development. This procedure will require the user to revisit each question answered in SHRIMP and either confirm the answer provided is still accurate or update the information. SHRIMP will generate a log of differences between the old plan to the new plan. SHRIMP will save a copy of the old plan for 10 years. The user is also encouraged to download the new and old plans for their records.

(5) SHRIMP includes an attachment that is the implementation plan. This attachment summarizes all the actions required to follow the DIMP plan, including capture and retention of data on any new pipeline installed. Since each user may have a unique recordkeeping system SHRIMP cannot advise the best way to track this data and instead provides a text box for the user to describe how these records will be captured and retained.

b. Identify threats

The Rule: The operator must consider the following categories of threats to each gas distribution pipeline: Corrosion, natural forces, excavation damage, other outside force damage, material, weld or joint failure (including compression coupling), equipment failure, incorrect operation, and other concerns that could threaten the integrity of its pipeline. An operator must consider reasonably available information to identify existing and potential threats. Sources of data may include, but are not limited to, incident and leak history, corrosion control records, continuing surveillance records, patrolling records, maintenance history, and excavation damage experience.

The Procedure: SHRIMP uses an interview process to identify threats. The user must go through interviews for each of the eight threats listed above. In many cases there are two or more subthreat interviews within each threat interview. For example, the corrosion threat interview includes separate interviews for external, internal and atmospheric corrosion, and the external corrosion interview includes further separate interviews for different materials of construction (bare/coated, protected/unprotected steel, cast/wrought iron, etc.). These interviews ask for reasonably available information to identify existing and potential threats. All of the sources of data listed in the rule are directly asked for by SHRIMP except for continuing surveillance – continuing surveillance is the periodic review of other inspection and maintenance data to determine the continued serviceability of the pipe. If prior continuing surveillance reviews resulted in additional inspections or maintenance, the results of those actions should be entered into SHRIMP where SHRIMP asks for the results of such inspection and maintenance, therefore indirectly SHRIMP considers continuing surveillance records.

c. Evaluate and rank risk

The Rule: An operator must evaluate the risks associated with its distribution pipeline. In this evaluation, the operator must determine the relative importance of each threat and estimate and rank the risks posed to its pipeline. This evaluation must consider each applicable current and potential threat, the likelihood of failure associated with each threat, and the potential consequences of such a failure. An operator may subdivide its pipeline into regions with similar characteristics (e.g., contiguous areas within a distribution pipeline consisting of mains, services and other appurtenances; areas with common materials or environmental factors), and for which similar actions likely would be effective in reducing risk.

The Procedure: The SHRIMP Advisory Group developed a risk ranking model that assigns a numeric weighting to answers provided by the user. The risk ranking model is described in an attachment to this document.

Subdividing is not required by SHRIMP but encouraged where answers to SHRIMP threat assessment questions are different for different parts of the system. Many of the questions asked by SHRIMP during the threat assessment process are intended to assess the likelihood and consequences of a failure due to the threat being assessed. SHRIMP also asks questions to help determine if certain regions of the pipeline have similar characteristics and for which similar actions would be effective in reducing risk. If actual or potential threats identified during the threat assessment process are concentrated in certain areas, the user is encouraged to subdivide the system for that threat, separating the areas that have an actual or potential threat from those areas that don't. Subsections can be geographic, by material, by type of equipment (for equipment threat), by excavator crews or contractors (for excavation threat) or any other way of subdividing that makes sense for the user's situation.

If the user decides to subsection for any threat those subsections continue through the risk-ranking, implementing additional measures and performance measures steps. The system may be subdivided differently for each threat, since it is unlikely that an area at risk for one threat (e.g. external corrosion) would also be entirely at risk from another threat (e.g. natural forces).

d. Identify and implement measures to address risks

The Rule: Determine and implement measures designed to reduce the risks from failure of its gas distribution pipeline. These measures must include an effective leak management program (unless all leaks are repaired when found).

The Procedure: SHRIMP offers the user at least one option to reduce the risk from failure for each threat except "Other." In the risk ranking screen, clicking on "A/A's" brings up a list of potential additional/accelerated actions ("A/A Actions") that the SHRIMP Advisors have determined could be effective in addressing the actual or potential threat. Some A/A Actions may be listed first because answers provided by the user during the threat assessment process suggests these A/A Actions are likely to be effective, whereas other A/A Actions that aren't expected to be effective are listed separately.

The user can select one or more of the A/A Actions included in SHRIMP, which will result in pre-written text being inserted into the "Implement Measures" section of written DIMP plan for the particular subsection of the system and threat. If the user has a better idea, or has already implemented action addressing this threat, the user should create a user-defined A/A Action and select that A/A Action for this threat and subsection. What the user writes when defining the A/A Action will be written into the written DIMP plan.

For some threats SHRIMP will recommend that the user initiate some A/A Action to reduce risk. For most threats the SHRIMP advisors could not agree on any relative risk score or combination of threat interview answers that should automatically require the user to specify an A/A Action. It is therefore up to the user to use his/her best judgment as to which threat-segments merit additional actions to reduce risk. The DIMP rule does not presume that every operator needs to implement additional measures.

If a user elects to include additional measures to reduce risk for any of the threats and/or subdivisions of the distribution system, SHRIMP will offer one or more options for performance measures specific to that threat and subdivision. The use may select pre-written text offered by SHRIMP or substitute a user-defined performance measure. The user is required to select at least one threat and subdivision-specific performance measure for every additional action selected in the previous step.

At the end of the SHRIMP process, SHRIMP displays a list of action items, including mandatory performance measures [(i) through (v) in the next section] and any threat-specific additional measures the operator determines are needed to evaluate the effectiveness of the operator's IM program in controlling each identified threat. The user is asked to describe in a text box how each action will be implemented and that information is included in the Implementation Plan included as an attachment to the written DIMP plan.

e. Measure performance, monitor results and evaluate effectiveness

The Rule: Develop and monitor performance measures from an established baseline to evaluate the effectiveness of its IM program. An operator must consider the results of its performance monitoring in periodically re-evaluating the threats and risks. These performance measures must include the following:

i. Number of hazardous leaks either eliminated or repaired as required by Sec. 192.703(c) of this subchapter (or total number of leaks if all leaks are repaired when found), categorized by cause;

ii. Number of excavation damages;

iii. Number of excavation tickets (receipt of information by the underground facility operator from the notification center);

iv. Total number of leaks either eliminated or repaired, categorized by cause;

v. Number of hazardous leaks either eliminated or repaired as required by Sec. 192.703(c) (or total number of leaks if all leaks are repaired when found), categorized by material; and

vi. Any additional measures the operator determines are needed to evaluate the effectiveness of the operator's IM program in controlling each identified threat.

The Procedure: The written plan created using SHRIMP includes a section stating that the operator will keep records necessary to report performance measures.(i) through (v). These performance measures must be captured and recorded outside of SHRIMP – SHRIMP does not currently include a recordkeeping or performance measure tracking mechanism, although those enhancements are contemplated in future upgrades.

Where a performance measure requires data that has not previously been collected and retained by the operator, the baseline for such performance measures will be the first year such data is collected and retained. Where the operator does have past data for any performance measure, the user must establish a baseline based on that historical data. The baseline should be included in the implementation plan text for that performance measure.

At the end of the SHRIMP process, SHRIMP displays a list of action items, including mandatory performance measures (i) through (v) above and any threat-specific additional measures the operator determines are needed to evaluate the effectiveness of the operator's IM program in controlling each identified threat. The user is asked to describe in a text box how each action will be implemented and that information is included in the Implementation Plan included as an attachment to the written DIMP plan.

f. Periodic Evaluation and Improvement

The Rule: An operator must re-evaluate threats and risks on its entire pipeline and consider the relevance of threats in one location to other areas. Each operator must determine the appropriate period for conducting complete program evaluations based on the complexity of its system and changes in factors affecting the risk of failure. An operator must conduct a complete program re-evaluation at least every five years. The operator must consider the results of the performance monitoring in these evaluations.

The Procedure: The SIF is currently working on a procedure to use SHRIMP to automate the re-evaluation process. SHRIMP includes in the written plan a requirement for periodic complete program re-evaluations at least once every 5 years and more often if certain conditions are met. The user should consider additional events that might trigger a complete program re-evaluation.

A re-evaluation using SHRIMP is essentially revisiting each SHRIMP interview screen to verify the answer is still valid or updating information as necessary. The risk ranking screen must be reviewed to ensure it is still accurate. The user must review each of the 5 mandatory performance measures described above and any threat-specific performance measures included in the written plan and compare results to the baseline [Note: Where a performance measure requires data that has not previously been collected and retained by the operator, the baseline for such performance measures will be the first year such data is collected and retained.] Particular attention should be given to the threat-specific performance measures that measure the effectiveness of specific A/A Actions. If one or more of these performance measures indicates that the A/A Action is not effective, the user should consider modifying the A/A Action and/or implementing additional A/A Actions.

g. Report results

The Rule: Report, on an annual basis, the four measures listed in paragraphs (e)(1)(i) through (e)(1)(iv) of this section, as part of the annual report required by Sec. 191.11. An operator also must report the four measures to the state pipeline safety authority if a state exercises jurisdiction over the operator's pipeline.

The Procedure: The SHRIMP written DIMP Plan includes a Section on reporting results, listing procedures for reporting to both the federal and state pipeline safety agencies. Currently data to report these performance measures must be collected and retained outside of SHRIMP, however the APGA Security and Integrity Foundation (SIF) may modify SHRIMP to enable it to retain and submit these performance measures as well as mechanical fitting failure data and other data required by Distribution Annual Report Form 7100.1-1.

11.4.2. Relative Risk Model

The centerpiece of the Simple, Handy, Risk-based Integrity Management Plan (SHRIMP) is the risk ranking model. SHRIMP uses an index model in which numeric scores are assigned based on answers provided by the user to questions asked by SHRIMP. The index model was developed by the APGA Security and Integrity Foundation (SIF) with guidance by an advisory group comprised of industry and federal and state pipeline safety regulators.

Risk is the product of the probability of a failure times the consequences of a failure. The SHRIMP relative risk model considers both the probability and consequences of a failure for each of the eight threats. The equation is as follows:

Relative Risk Score	=	Probability Score (Normalized to 1 - 10)	x	Consequence Score (1.0 - 1.5)	x	Leak History Factor (1 + % of Lks)	x	Incident Probability Factor (1.0 or 1.25)

Each of the four components that go into the relative risk score are described in the following sections.

Probability Scoreis the sum of points assigned by answers to threat interview questions. Each segment receives a relative probability score for each threat based on the answers to a series of questions. The probability questions are based on the GPTC DIMP guidance, as modified and added to by the SIF SHRIMP Advisors. The weighting given to each possible answer are based on the knowledge and experience of the SHRIMP Development Team and the SHRIMP Advisors.

Table 11.56. Probability Scores

Threat	Subthreat category	Maximum Score	Minimum Score	Incident Probability Factor
Natural Forces	No subthreats	19	0	1
Other Outside Forces	No subthreats	12	0	1.0
Excavation Damage	Grouping by concentration of damages or tickets	39	0	1.25
	Grouping by operator crew or operator contractor damage	34	0	1.25
	Grouping by Third Party Damage	31	0	1.25
	Blasting	15	0	1.25
Corrosion	External Corrosion	16	1	1
	Internal Corrosion	30	1	1
	Atmospheric Corrosion	25	1	1
Incorrect Operations	Failure to Follow Procedures	5	1	1.25
	Inadequate Procedures	5	1	1.25
	Operator Qualification	5	1	1.25

	Drug & Alcohol	5	1	1.25
Equipment	No subthreats	5	1	1
Material, Welds or Joints	No subthreats	5	1	1
Other	No subthreats	None (User assigns rank)		1

Because there are different numbers of questions for each threat and subthreat, the maximum possible score for each threat and subthreat are different, therefore the probability score for each threat-segment is normalized to a scale of 1 - 10 using this equation:

Normalized probability score = 1 + (9 x (subthreat score - subthreat minimum score) / (subthreat maximum score - subthreat minimum score))

For example, if a segment received a score of 9 for external corrosion the normalized probability score would be 1 + (9 x (9-1) / (16-1) = 1 + 9 x 8/15 = 5.8

Incident Probability Factor

The normalized probability factor described above is useful to rank various sections by the probability of a failure occurring within each of the eight threats, but SHRIMP also must rank sections across the eight threats. Failures due to some threats are more likely to cause death, injury or significant property loss than other threats. DOT Distribution Annual and Incident Report data shown below provide an indication of how likely it is that a failure (e.g. leak) due to one of the 8 threats will result in death, injury or significant property loss.

Table 11.57. Incident Probability Factor

Reported Cause of Incidents and Failures 2005-2007	# of Incidents	# of Failures	Incidents/1000 Failures	Normalized to Corrosion
Corrosion	6	293,933	0.02	1
Excavation Damage	73	338,666	0.22	11
Incorrect Operations	8	30,145	0.27	13
Material, Weld or Joint Failure	8	147,384	0.05	3
Equipment Failure	6	140,442	0.04	2
Natural Force Damage	22	77,229	0.28	14
Other Outside Force Damage	39	37,426	1.04	51
All Other Causes *	NA	NA	NA	
* Excluding Fire First Incidents				

The results of this analysis find that failures due to three threats (corrosion, material failure and equipment failure) are least likely to result in reportable incidents, that failures due to excavation damage, incorrect operations and natural force damage are moderately likely to result in reportable incidents and that other outside force damage failures are most likely to result in reportable incidents.

The advisors agreed to assign an Incident Probability Factor of 1.0 (no increase in relative risk score) for Corrosion, Materials/Welds, Equipment, and Other Outside Force Threats where it is relatively unlikely a failure will result in a reportable incident. For Excavation, Incorrect Operations, and Natural Force Threats where it is relatively more likely that a failure will result in a reportable incident the advisors agreed on an Incident Probability Factor of 1.25 (e.g. a 25% increase in relative risk score for these threats).

Further investigation of the "other outside force" category revealed that virtually all the incidents involved vehicles striking above ground facilities, usually meter sets. The SHRIMP advisors agreed with the PHMSA Phase 1 report conclusions that there was not enough information to conclude that vehicular damage could have been anticipated at the location of these incidents or whether meter protection existed, therefore no additional weighting is provided for this threat. SHRIMP does, however, include assessment of vehicle damage in the threat assessment and offer additional/accelerated actions if vehicular damage is found to be a significant threat.

If the user sections the system by geographic area, the **Consequence Score** is determined by points assigned based answers to threat interview questions as follows:

Table 11.58. Consequence Score (Geographic Area Sections)

	Question	Possible Answers	Weighting
CSQ-1	Are the pressure and/or diameter of this section greater than or about the same as the system as a whole?	Substantially greater	0.2
		Somewhat greater	0.1
		About the same	0
CSQ-2	Is this section predominantly located in business districts or outside business districts (as those are defined for leak survey)?	Within Business Districts	0.15
		Outside Business Districts	0
CSQ-3	How long would it typically take utility crews to reach this part of the system after receiving notice of a possible failure?	Less than one (1) hour	0
		Between one (1) and two (2) hours	0.025

		More than two (2) hours	0.05
CSQ-4	What would be the impact on the utility and its customers if this section were to fail?	Low	0
		Moderate	0.05
		High	0.1

The base consequence factor is 1.0

1. Greater pressure and/or diameter can increase the consequence factor by up to 20% (1.0 to 1.2)
2. Sections predominantly within business districts get an additional 15% increase in the consequence factor
3. The time to respond to a failure results in an increase in consequence factor of up to 5% (1.0 to 1.05)
4. The significance of the facility can result in an increase in consequence factor of up to 10% (1.0 to 1.1)

These weightings are based on the knowledge of the subject matter experts on the SHRIMP Advisory Group. These increases are added together to calculate the consequence factor for the section. If all four questions were answered so that maximum scores were assigned, the consequences factor would be 1.50 (1.2 + 1.15 + 1.05 + 1.1). The overall relative risk score would be increased by 50%.

If all four questions are answered so the minimum scores are assigned, then the consequence factor will be 1.0 and the relative risk score would be unchanged by this factor.

If the user does not create subsections for a threat, then these consequence questions are not asked.

For the threats shown below where the geography based threat questions do not apply the following threat specific consequence questions are asked:

Table 11.59. Consequence Score (Non-Geographic Area Sections)

	Question	Possible Answers	Weighting
CSQ-EXC1	Have the (crews/contractors/excavators) identified for this section caused damage that resulted in a reportable incident?	Yes	0.3
		No	0
CSQ-EXC2	Considering disruption of service and cost to return the system to service, how serious are the damages caused by the (crews/contractors/excavators) identified for this section when compared to all other excavation caused damages?	More serious	0.3
		Less serious	0
		About the same	0.1
CSQ-GEN1	What would be the potential consequences (injuries and/or property loss) if a failure were to occur because of this problem?	High likelihood of serious injury and/or property loss	0.5
		Moderate likelihood of injury and/or property loss.	0.25
		Not likely to result in injury and/or property loss.	0
EQIPCSQ-1	Is the size/capacity of the equipment substantially greater or lesser than other equipment in the system as a whole?	Substantially greater	0.2
		Somewhat greater	0.1
		About the same	0
EQIPCSQ-2	Does the equipment primarily affect the system located in the business district?	Within Business Districts	0.15
		Outside Business Districts	0
EQIPCSQ-3	How long would it typically take utility crews to reach this part of the system after receiving notice of a possible failure?	Less than one (1) hour	0
		Between one (1) and two (2) hours	0.025
		More than two (2) hours	0.05
EQIPCSQ-4	What would be the impact on the utility and its customers if this equipment were to fail?	Low	0
		Moderate	0.05
		High	0.1

Leak Cause Factor

While most leaks are repaired without incident, the SHRIMP advisors felt that the users integrity management plan should consider the relative percentage of leaks by cause.

The Leak Cause Factor equals 1 + the percentage of leaks associated with threat to the total number of leaks for the system.

If the number of total leaks over a five year period are less than 50, the national average is used rather than the userís leak history data because with fewer than 50 leak repairs the relative percentages of leaks by cause may be skewed by a handful of leak repairs that are not representative of the system. The national average is shown below, taken from leak repair data reported to PHMSA by all distribution operators on Annual Report Form 7100.1-1..

Table 11.60. Reported Cause Of Failures (2005-2009)

Threat	Failures	Percent	Leak History Factor
Corrosion	399,378	26	1.26
Excavation Damage	161,079	11	1.11
Incorrect Operations	38,416	3	1.03
Material, Weld or Joint Failure	155,255	10	1.10
Equipment Malfunction	326,793	21	1.21
Natural Force Damage	82,565	5	1.05
Other Outside Force Damage	40,529	3	1.03
All Other Causes	329,401	21	NA *
Totals	1,533,416	100	

* Since the threat category "Other" is not assigned a relative risk score by SHRIMP the leak history factor is not used for that threat.

11.5. PLAN CHANGE LOG

This section provides a log of the plan changes detailing differences between this Plan (Version 2.2.1) and the previous Plan (Version 2.1.1).

11.5.1. CHANGES TO THREAT ASSESSMENT

Overview

The following summarizes the differences in the threat assessment between this version of the plan and the prior version.

Please refer to Chapter 4, *THREAT ASSESSMENT* in this plan for details regarding threats sections that were added or removed.

Please refer to Chapter 4, *THREAT ASSESSMENT* in the prior plan for details regarding threats sections that are no longer present in this version of the plan.

Corrosion

Atmospheric Corrosion

Atmospheric corrosion was determined to be a threat (in both versions).

Atmospheric corrosion was determined to be limited to certain portions of the system and, therefore, separate threat assessments were performed on the following sections of the system:

Section Inside Atmospheric Corrosion:

Atmospheric corrosion in section **Inside Atmospheric Corrosion (Inside Service Pipe)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Outside Atmospheric Corrosion:

Atmospheric corrosion in section **Outside Atmospheric Corrosion (Outside Service Riser Pipe)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Bridges and Tunnels:

Atmospheric corrosion in section **Bridges and Tunnels (Bridge and Tunnel Inspections)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

External Corrosion On Coated, Cathodically Protected, Steel Mains And Services

External corrosion on coated, cathodically protected, steel mains and services was determined to be a threat (in the current version).

External corrosion on coated, cathodically protected, steel mains and services was determined not to be a threat (in the prior version).

External Corrosion On Bare, Cathodically Protected, Steel Mains And Services

External corrosion on bare, cathodically protected, steel mains and services was determined not to be a threat (in both versions).

External Corrosion On Coated, Unprotected, Steel Mains And Services

External corrosion on coated, unprotected, steel mains and services was determined to be a threat (in both versions).

External Corrosion On Bare, Unprotected, Steel Mains And Services

External corrosion on bare, unprotected, steel mains and services was determined to be a threat (in both versions).

External Corrosion On Cast, Wrought, Ductile Iron Mains And Services (8" Or Smaller)

External corrosion on cast, wrought, ductile iron mains and services (8" or smaller) was determined to be a threat (in both versions).

External Corrosion On Plastic Mains And Services With Metal Fittings

External corrosion on plastic mains and services with metal fittings was determined not to be a threat (in both versions).

External Corrosion On Other Metal

External corrosion on other metal was determined to be a threat (in both versions).

External Corrosion On Cast, Wrought, Ductile Iron Mains And Services (larger Than 8")

External corrosion on cast, wrought, ductile iron mains and services (larger than 8") was determined to be a threat (in both versions).

Internal Corrosion

Internal corrosion was determined to be a threat (in both versions).

Equipment Malfunctions

Equipment Malfunctions

Equipment malfunctions was determined to be a threat (in both versions).

Equipment Malfunctions Due To Failing Valves

Equipment malfunctions due to failing valves was determined to be a threat (in both versions).

Equipment malfunctions due to failing valves was determined to be limited to certain portions of the system and, therefore, separate threat assessments were performed on the following sections of the system:

Section Service Valves:

Equipment malfunctions due to failing valves in section **Service Valves (All Service Valves)** was determined to be a threat (in both versions).

Section Distribution Valves:

Equipment malfunctions due to failing valves in section **Distribution Valves (Distribution Valves Not Located in Basins)** was determined to be a threat (in both versions).

Section Network Valves:

Equipment malfunctions due to failing valves in section **Network Valves (All Network Valves)** was determined to be a threat (in both versions).

Section Remote Oper Valves:

Equipment malfunctions due to failing valves in section **Remote Oper Valves (All Remote Op Valves)** was determined to be a threat (in both versions).

Section Kerotest Valve:

Equipment malfunctions due to failing valves in section **Kerotest Valve (Kerotest Valve (Kerotest, Prior to Mid 1980's))** was determined to be a threat (in both versions).

Section Security Valves:

Equipment malfunctions due to failing valves in section **Security Valves (Slam Shut Security Valves)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Gas Operations Distribution Valves:

Equipment malfunctions due to failing valves in section **Gas Operations Distribution Valves (Distribution Valves Located Inside Valve Basins)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Equipment Malfunctions Due To Failing Regulators/relief Valves

Equipment malfunctions due to failing regulators/relief valves was determined not to be a threat (in both versions).

Equipment Malfunctions Due To Failing Other Equipment

Equipment malfunctions due to failing other equipment was determined to be a threat (in both versions).

Equipment malfunctions due to failing other equipment was determined to be limited to certain portions of the system and, therefore, separate threat assessments were performed on the following sections of the system:

Section Gate Stations:

Equipment malfunctions due to failing other equipment in section **Gate Stations (All Gate Stations)** was determined to be a threat (in both versions).

Section Medium Pressure Vaults:

Equipment malfunctions due to failing other equipment in section **Medium Pressure Vaults (High Pressure to Medium Pressure Vaults)** was determined to be a threat (in both versions).

Section Low Pressure Vaults:

Equipment malfunctions due to failing other equipment in section **Low Pressure Vaults (Medium Pressure to Low Pressure Vaults)** was determined to be a threat (in both versions).

Section High Pressure to High Pressure Stations:

Equipment malfunctions due to failing other equipment in section **High Pressure to High Pressure Stations (High Pressure to High Pressure Station)** was determined to be a threat (in both versions).

Equipment Malfunctions Due To Valves Prone To Failure

Equipment malfunctions due to valves prone to failure was determined not to be a threat (in both versions).

Equipment Malfunctions Due To Regulators / Relief Valves Prone To Failure

Equipment malfunctions due to regulators / relief valves prone to failure was determined not to be a threat (in both versions).

Equipment Malfunctions Due To Other Equipment Prone To Failure

Equipment malfunctions due to other equipment prone to failure was determined not to be a threat (in both versions).

Excavation Damage

Excavation Damage Due To Concentrated Damages Or Tickets

Excavation damage due to concentrated damages or tickets was determined not to be a threat (in the current version).

Excavation damage due to concentrated damages or tickets was determined to be a threat (in the prior version).

Excavation Damage Due To Your Crew Or Contractor Damages

Excavation damage due to your crew or contractor damages was determined to be a threat (in both versions).

Excavation damage due to your crew or contractor damages was determined to be limited to certain portions of the system and, therefore, separate threat assessments were performed on the following sections of the system:

Section Peoples Gas:

Excavation damage due to your crew or contractor damages in section **Peoples Gas (Damages to PGL facilities by PGL Crews (Peoples Gas))** was determined to be a threat (in both versions).

Section Peoples Gas Contractors:

Excavation damage due to your crew or contractor damages in section **Peoples Gas Contractors (Damages to PGL facilities by 2nd Parties (Peoples Gas Contractors))** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Excavation Damage Due To Third Party Damages

Excavation damage due to third party damages was determined to be a threat (in both versions).

Excavation damage due to third party damages was determined to be limited to certain portions of the system and, therefore, separate threat assessments were performed on the following sections of the system:

Section City of Chicago, Water:

Excavation damage due to third party damages in section **City of Chicago, Water (Chicago Water Dept)** was determined to be a threat (in both versions).

Section Benchmark Construction:

Excavation damage due to third party damages in section **Benchmark Construction (Water Main Installation Contractor for City of Chicago)** was determined to be a threat (in both versions).

Section Joel Kennedy Construction:

Excavation damage due to third party damages in section **Joel Kennedy Construction (Water Main Installation Contractor for City of Chicago)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Excavation Damage Due To Blasting Damage

Excavation damage due to blasting damage was determined not to be a threat (in both versions).

Incorrect Operations

Incorrect Operations Due To Inadequate Procedures

Incorrect operations due to inadequate procedures was determined not to be a threat (in both versions).

Incorrect Operations Due To Failure To Follow Procedures

Incorrect operations due to failure to follow procedures was determined not to be a threat (in both versions).

Incorrect Operations Due To Operator Qualification Revocation

Incorrect operations due to operator qualification revocation was determined not to be a threat (in the current version).

Incorrect operations due to operator qualification revocation was determined not to be a threat (in the prior version).

Incorrect Operations Due To Drugs And Alcohol

Incorrect operations due to drugs and alcohol was determined not to be a threat (in both versions).

Materials, Welds and Joints

Material, Weld Or Joint

Material, weld or joint was determined to be a threat (in both versions).

Material, Weld Or Joint Due To Manufacturing Defects

Material, weld or joint due to manufacturing defects was determined to be a threat (in both versions).

Material, Weld Or Joint Due To Workmanship Defects

Material, weld or joint due to workmanship defects was determined not to be a threat (in both versions).

Material, Weld Or Joint Due To Known Problem Materials

Material, weld or joint due to known problem materials was determined to be a threat (in both versions).

Natural forces

Natural Forces

Natural forces was determined to be a threat (in both versions).

Natural forces was determined to be limited to certain portions of the system and, therefore, separate threat assessments were performed on the following sections of the system:

Section Entire System:

Natural forces in section **Entire System (Entire System Except 6" Diameter Cast Iron Mains)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section 6" Cast Iron Mains:

Natural forces in section **6" Cast Iron Mains (6" Diameter Cast Iron Mains)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Other outside forces

Other Outside Forces

Other outside forces was determined to be a threat (in both versions).

Other outside forces was determined to be limited to certain portions of the system and, therefore, separate threat assessments were performed on the following sections of the system:

Section Other Outside Force Damage - Services:

Other outside forces in section **Other Outside Force Damage - Services (Other Outside Force Damages on Service Pipes)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Other Outside Force Damage - Mains:

Other outside forces in section **Other Outside Force Damage - Mains (Other Outside Force Damages on Main Pipes)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Other threats

Other Threats

Other threats was determined to be a threat (in both versions).

Other threats was determined to be limited to certain portions of the system and, therefore, separate threat assessments were performed on the following sections of the system:

Section Bell Joints & Mechanical Joints:

Other threats in section **Bell Joints & Mechanical Joints (Leaking Main Bell & Mechanical Joints Due to Age)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Other Outside Force Damage - Crossbores:

Other threats in section **Other Outside Force Damage - Crossbores (Gas Pipe Bored Through Sewer Lateral)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Excavation Damage - Critical Facilities:

Other threats in section **Excavation Damage - Critical Facilities (Excavation near HP Pipelines, >=16" MP Pipelines, Vaults, Remote Operated Valves, and Current Rectifiers)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Incorrect Operations - Non-Approved Material:

Other threats in section **Incorrect Operations - Non-Approved Material (Installation of Non-Approved Materials)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Other Outside Force - Occupant Use:

Other threats in section **Other Outside Force - Occupant Use (Unauthorized Turn-on By Customer)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Excavation Damage - Inactive Services:

Other threats in section **Excavation Damage - Inactive Services (Service Pipes Designated as Inactive)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Other - Soft Closed Accounts:

Other threats in section **Other - Soft Closed Accounts (Supply to Vacant Property Remaining Active)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Inaccessible Valves:

Other threats in section **Inaccessible Valves (Paved Over, Dirt in B-Box)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Meters/Shutoffs Inaccessible:

Other threats in section **Meters/Shutoffs Inaccessible (No Access to Meter or Shutoff)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Incorrect Operations - Improper Odorization:

Other threats in section **Incorrect Operations - Improper Odorization (Too Little or Much Mercaptin)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

Section Corrosion - Cased Pipelines:

Other threats in section **Corrosion - Cased Pipelines (Cathodic Protected Steel Pipelines inside Metallic Casings)** was determined to be a threat (in the current version).

Section is not present (in the prior version).

11.5.2. CHANGES TO RISK EVALUATION AND PRIORITIZATION

Overview

The following summarizes the differences in the risk ranking between this version of the plan and the prior version.

Please refer to Section 11.5.1, "CHANGES TO THREAT ASSESSMENT" for details regarding risk sections that were added or removed.

Please refer to Section 11.5.5, "CHANGES TO LIST OF ANSWERS FROM SHRIMP™ INTERVIEWS" which provides details about changes to probability scores or consequence factors.

a. **Section: City of Chicago, Water**

   Threat: Excavation Damage -> Third Party Damages -> Third Party Damages

   Description: Chicago Water Dept

   The section ranking has changed from the previous version of the plan.

   This section was ranked by the user as 3 in the previous version.

   The user ranking was removed in the current version.

   The probability score changed from 19.73 in the previous version to 22.52 in the current version.

   The current score is based (in part) on:

   - Excavation damages are being caused by third-party excavators not following one call laws.
   - Excavation damages caused by third-party excavators have been due to unmarked or inaccurately marked facilities.
   - Excavation damages are caused by failure to protect pipe during backfill operations.
   - The (crews/contractors/excavators) identified for this section have caused damage that resulted in a reportable incident.

   The prior score was based (in part) on:

   - Excavation damages are being caused by third-party excavators not following one call laws.
   - Excavation damages caused by third-party excavators have been due to unmarked or inaccurately marked facilities.
   - Excavation damages are caused by failure to protect pipe during backfill operations.
   - The (crews/contractors/excavators) identified for this section have caused damage that resulted in a reportable incident.
   - Operator overrode ranking with this explanation:

Third party with the most hit to PGL facilities

The leak cause factor changed from 1.32 in the previous version to 1.275 in the current version. This is due to changes in leak, failure and damage information.

b. **Section: Benchmark Construction**

Threat: Excavation Damage -> Third Party Damages -> Third Party Damages

Description: Water Main Installation Contractor for City of Chicago

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 5 in the previous version.

This section has been ranked by the user as 2 in the current version.

The probability score changed from 19.01 in the previous version to 16.51 in the current version.

The current score is based (in part) on:

- Excavation damages are being caused by third-party excavators not following one call laws.
- Excavation damages caused by third-party excavators have been due to unmarked or inaccurately marked facilities.
- Excavation damages are caused by failure to protect pipe during backfill operations.
- Disruption of service and cost to return the system to service after the damages caused by the (crews/contractors/excavators) identified for this section are about the same when compared to all other excavation caused damages
- Operator overrode ranking with this explanation:

  Equal Relative Risk Score to Joel Kennedy Damages, but per PGL Hit Database, responsible for higher hits per 1000 locate ratio.

The prior score was based (in part) on:

- Excavation damages are being caused by third-party excavators not following one call laws.
- Excavation damages caused by third-party excavators have been due to unmarked or inaccurately marked facilities.
- Excavation damages are caused by failure to protect pipe during backfill operations.
- The (crews/contractors/excavators) identified for this section have caused damage that resulted in a reportable incident.
- Operator overrode ranking with this explanation:

  Combined this is the third party with second most hits on PGL facilities.

The consequence score changed from 1.5 in the previous version to 1.1 in the current version. This is due to changes in operator responses to the consequence questions.

The leak cause factor changed from 1.32 in the previous version to 1.275 in the current version. This is due to changes in leak, failure and damage information.

c. **Section: Joel Kennedy Construction**

Threat: Excavation Damage -> Third Party Damages -> Third Party Damages

Description: Water Main Installation Contractor for City of Chicago

This section is new in this version of the plan.

d. **Section: Bell Joints & Mechanical Joints**

Threat: Other Threats -> Other

Description: Leaking Main Bell & Mechanical Joints Due to Age

This section was ranked by the user as 6 in the previous version.

This section has been ranked by the user as 4 in the current version.

e. **Section: Peoples Gas Contractors**

Threat: Excavation Damage -> Crew or Contractor Damages -> Crew or Contractor Damages

Description: Damages to PGL facilities by 2nd Parties (Peoples Gas Contractors)

This section is new in this version of the plan.

f. **Section: 6" Cast Iron Mains**

Threat: Natural Forces -> Concentrated Area

Description: 6" Diameter Cast Iron Mains

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 9 in the previous version.

This section has been ranked by the user as 6 in the current version.

The probability score changed from 15 in the previous version to 13.69 in the current version.

The current score is based (in part) on:

- System/section contains Cast Iron pipe 8" or less in diameter.
- Portions of the system/section are in areas prone to land subsidence, earthquakes or washouts.
- Damages have occurred on cast iron due to ground movement, frost heave, earth subsidence.
- Leaks, failures or damages are averaging one (1) or more per year.
- Operator overrode ranking with this explanation:

  Per SME Group Meeting, ranked one threat higher due to high concentration of 6"CI Mains and susceptibility of this section to fail.

The prior score was based (in part) on:

- System/section contains Cast Iron pipe 8" or less in diameter.
- Portions of the system/section are in areas prone to land subsidence, earthquakes or washouts.
- Damages have occurred on cast iron due to ground movement, frost heave, earth subsidence.
- Natural forces have caused leaks, failures or damages to steel or plastic pipeline in the system/section.
- Operator overrode ranking with this explanation:

  Zoomerang survey rank is 9 (tie)

The consequence score changed from 1.05 in the previous version to 1.15 in the current version. This is due to changes in operator responses to the consequence questions.

The leak cause factor changed from 1.143 in the previous version to 1.11 in the current version. This is due to changes in leak, failure and damage information.

g. **Section: Entire System**

Threat: Natural Forces -> Concentrated Area

Description: Entire System Except 6" Diameter Cast Iron Mains

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 2 in the previous version.

This section has been ranked by the user as 7 in the current version.

The consequence score changed from 1.1 in the previous version to 1 in the current version. This is due to changes in operator responses to the consequence questions.

The leak cause factor changed from 1.143 in the previous version to 1.11 in the current version. This is due to changes in leak, failure and damage information.

h. **Section: Cast, Ductile, Wrought Iron (larger than 8")**

Threat: Corrosion -> External Corrosion

Description: Entire System

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 18 in the previous version.

The user ranking was removed in the current version.

The probability score changed from 10.24 in the previous version to 11.21 in the current version.

The current score is based (in part) on:

- Fractures have occurred on the cast/ductile iron pipes other than those related to excavation activities.
- Repaired leaks per mile of mains are increasing.
- Cast/ductile iron mains have steel laterals connected with no electrical isolation.
- Exposed pipe inspections indicate a corrosion problem.

The prior score was based (in part) on:

- Fractures have occurred on the cast/ductile iron pipes other than those related to excavation activities.
- Cast/ductile iron mains have steel laterals connected with no electrical isolation.
- Exposed pipe inspections indicate that graphitization is occurring.
- Confirmed corrosion leaks have occurred on this section.
- Operator overrode ranking with this explanation:

  Use default SHRIMP ranking

The leak cause factor changed from 1.218 in the previous version to 1.104 in the current version. This is due to changes in leak, failure and damage information.

i. **Section: Other Outside Force Damage - Services**

Threat: Other Outside Forces -> Other Outside Forces

Description: Other Outside Force Damages on Service Pipes

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 5 in the previous version.

The user ranking was removed in the current version.

The probability score changed from 7.81 in the previous version to 10.14 in the current version.

The current score is based (in part) on:

- Above ground facilities are being hit by vehicles.
- Below ground facilities have been damaged due to heavy vehicles driving along or over the facility location.
- Damage has been caused by malicious actions (vandalism) of unauthorized individuals or unauthorized alteration of system.

The prior score was based (in part) on:

- Above ground facilities are being hit by vehicles.
- Damage has been caused by malicious actions (vandalism) of unauthorized individuals or unauthorized alteration of system.
- A failure of this section could result in significant disruption of service.
- Operator overrode ranking with this explanation:

  Zoomerang survey rank is 5

The consequence score changed from 1.1 in the previous version to 1 in the current version. This is due to changes in operator

responses to the consequence questions.

j. **Section: Cast, Ductile, Wrought Iron (8" or smaller)**

Threat: Corrosion -> External Corrosion

Description: Entire System

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 2 in the previous version.

The user ranking was removed in the current version.

The probability score changed from 11.25 in the previous version to 9.51 in the current version.

The current score is based (in part) on:

- Repaired leaks per mile of mains are increasing.
- Fractures have occurred on the cast/ductile iron pipes other than those related to excavation activities.
- Cast/ductile iron mains have steel laterals connected with no electrical isolation.
- Exposed pipe inspections indicate that graphitization is occurring.

The prior score was based (in part) on:

- Repaired leaks per mile of mains are increasing.
- Fractures have occurred on the cast/ductile iron pipes other than those related to excavation activities.
- Section contain leaks found and being monitored that are suspected to be corrosion related and reflect a corrosion problem.
- Cast/ductile iron mains have steel laterals connected with no electrical isolation.
- Operator overrode ranking with this explanation:

  Frequency and consequence of this material failing is high

The leak cause factor changed from 1.218 in the previous version to 1.104 in the current version. This is due to changes in leak, failure and damage information.

k. **Section: Low Pressure Vaults**

Threat: Equipment Malfunction -> Other Equipment Experiencing Failure -> Specific Other Equipment Experiencing Failure

Description: Medium Pressure to Low Pressure Vaults

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 25 in the previous version.

The user ranking was removed in the current version.

The probability score changed from 5.68 in the previous version to 9.44 in the current version.

The current score is based (in part) on:

- The likelihood of this piece of equipment failing is medium.
- The likelihood that a failure of this equipment will become a Grade 1 leak is high.
- The failing element of the equipment causes system pressure to exceed the MAOP.
- The equipment is primarily within business districts.

The prior score was based (in part) on:

- The likelihood of this piece of equipment failing is medium.
- The likelihood that a failure of this equipment will become a Grade 1 leak is high.
- Operator overrode ranking with this explanation:

Zoomerang survey rank is 25 (tie)

The consequence score changed from 1 in the previous version to 1.2 in the current version. This is due to changes in operator responses to the consequence questions.

The leak cause factor changed from 1.033 in the previous version to 1.015 in the current version. This is due to changes in leak, failure and damage information.

l. **Section: Other Outside Force Damage - Mains**

Threat: Other Outside Forces -> Other Outside Forces

Description: Other Outside Force Damages on Main Pipes

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 14 in the previous version.

The user ranking was removed in the current version.

The probability score changed from 4.26 in the previous version to 9.04 in the current version.

The current score is based (in part) on:

- Above ground facilities are being hit by vehicles.
- Below ground facilities have been damaged due to heavy vehicles driving along or over the facility location.
- The pressure/diameter of this section is somewhat greater than the average of the system.
- A failure of this section could result in moderate disruption of service.

The prior score was based (in part) on:

- Below ground facilities have been damaged due to heavy vehicles driving along or over the facility location.
- A failure of this section could result in moderate disruption of service.
- Operator overrode ranking with this explanation:

  Zoomerang survey rank is 14

The consequence score changed from 1.05 in the previous version to 1.15 in the current version. This is due to changes in operator responses to the consequence questions.

m. **Section: Peoples Gas**

Threat: Excavation Damage -> Crew or Contractor Damages -> Crew or Contractor Damages

Description: Damages to PGL facilities by PGL Crews (Peoples Gas)

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 16 in the previous version.

The user ranking was removed in the current version.

The probability score changed from 10.26 in the previous version to 7.92 in the current version.

The current score is based (in part) on:

- Excavation damages caused by operator's crews or contractors have been due to unmarked or inaccurately marked facilities.
- Excavation damages caused by operator's crews or contractors have occurred due to failure to follow company procedures/safety practices.
- Excavation damages are caused by failure to protect pipe during backfill operations.

The prior score was based (in part) on:

- Excavation damages caused by operator's crews or contractors have been due to unmarked or inaccurately marked facilities.
- Excavation damages caused by operator's crews or contractors have occurred due to failure to follow company procedures/safety practices.

- The (crews/contractors/excavators) identified for this section have caused damage that resulted in a reportable incident.
- Disruption of service and cost to return the system to service after the damages caused by the (crews/contractors/excavators) identified for this section are about the same when compared to all other excavation caused damages
- Operator overrode ranking with this explanation:

  Third most number of 3rd party damage to PGL facilities. Use default SHRIMP ranking

The consequence score changed from 1.4 in the previous version to 1 in the current version. This is due to changes in operator responses to the consequence questions.

The leak cause factor changed from 1.32 in the previous version to 1.275 in the current version. This is due to changes in leak, failure and damage information.

n. **Section: Service Pipe**

Threat: Material, Weld or Joint Failure -> Manufacturing Defects

Description: Clear Plastic

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 31 in the previous version.

The user ranking was removed in the current version.

The leak cause factor changed from 1.005 in the previous version to 1.015 in the current version. This is due to changes in leak, failure and damage information.

o. **Section: Gate Stations**

Threat: Equipment Malfunction -> Other Equipment Experiencing Failure -> Specific Other Equipment Experiencing Failure

Description: All Gate Stations

The section ranking has changed from the previous version of the plan.

This section was ranked by the user as 45 in the previous version.

The user ranking was removed in the current version.

The probability score changed from 1.03 in the previous version to 7.26 in the current version.

The current score is based (in part) on:

- The likelihood that a failure of this equipment will become a Grade 1 leak is high.
- The likelihood of this piece of equipment failing is low.
- The failing element of the equipment causes system pressure to exceed the MAOP.
- The size/capacity of the equipment is substantially greater than other equipment in the system as a whole.

The prior score was based (in part) on:

- The likelihood of this piece of equipment failing is low.
- Operator overrode ranking with this explanation:

  Zoomerang survey rank is 45

The consequence score changed from 1 in the previous version to 1.3 in the current version. This is due to changes in operator responses to the consequence questions.

The leak cause factor changed from 1.033 in the previous version to 1.015 in the current version. This is due to changes in leak, failure and damage information.

p. **Section: Bridges and Tunnels**

Threat: Corrosion -> Atmospheric Corrosion -> Atmospheric Corrosion

Description: Bridge and Tunnel Inspections

The section ranking has changed from the previous version of the plan.